

Appendix 2-34 Cargo Handling in Hayderpasa Port

Cargo Volume Handled By Quay Type

Year	Hayderpasa					
	Passenger	Gen. Cargo	Container	RO/RO	Bulk	Total
1983		1,355,339	92,415	297	383,444	1,831,495
1984		1,557,784	141,486		361,148	2,060,418
1985		1,755,889	182,989	348,735	239,371	2,526,984
1986		1,802,650	246,042	560,761	343,945	2,953,398
1987		2,273,094	292,226	494,562	214,752	3,274,634
1988		1,609,903	338,925	497,359	723,667	3,169,854

Source: TCDD

Quays in Hayderpasa (1989)

Quay Group	NO.	Length(m)	Depth(m)
Small Boat Quay	1	150	4.5
Gen. Cargo	2	220	5.5
Bulk Solid	3	190	10
Gen. Cargo	4. 5. 6. 7. 8	800	10
Bulk Solid and RO/RO	9	218	8.25
RO/RO and Gen. Cargo	10. 11	350	10
Container Quay	12. 13. 14	595	10
Bulk Solid	15	238	8
Gen. Cargo	16. 17	282	6
Ferry Boat Quay	18. 19	306	6-4.5
TOTAL		3,349	

*Berthing Capacity = 2,500 ships/year (Excluding Ferry)

Source: TCDD

Data on Cargo Handling Operation (Hayderpasa)

Hayderpasa Informations		data = Dec, 1989
1. Average waiting time	container general cargo ship	20-25 hours/ship around 100 hours
2. handled tonnage	TCDD per gang hour	111,000 tons 20.6 tons/hour/gang
3. gang spare time		0.27
4. container handling	gantry crane	20-30 units/hr Avg. 22 units/gantry
5. number of calling	incl. Ro-Ro	1,600 in 1989
6. berth length	-8-12m	3,349 meters
7. necessary days to pass thorough the port		no answer
8. Inland Depots (Bonded area)	under construction	Arankoy (8km frm port along E5)

Fig. A5-1-1 Synoptic Chart : N(W) type

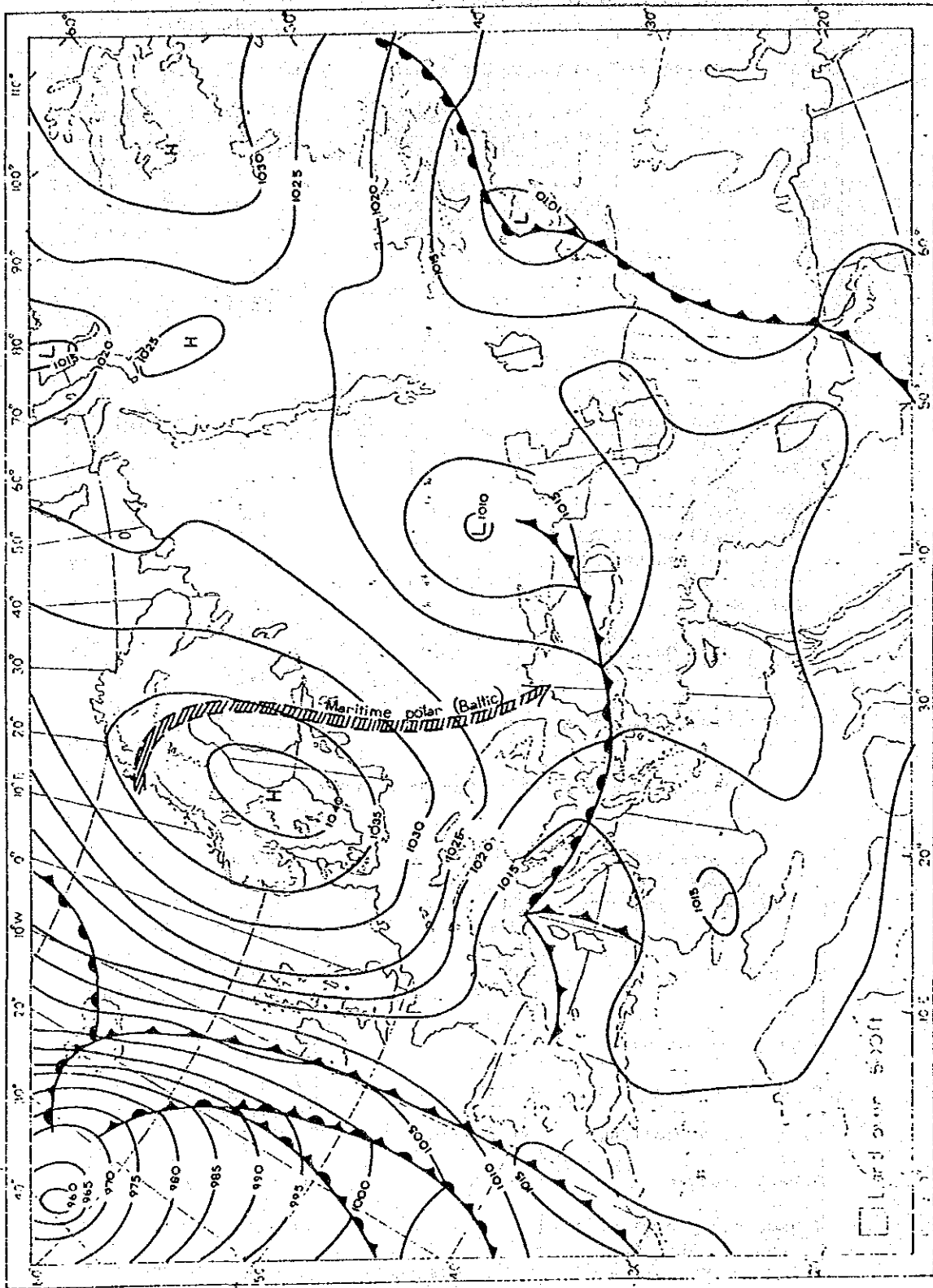


Fig. A5-1-2 Synoptic Chart : NE(W) type

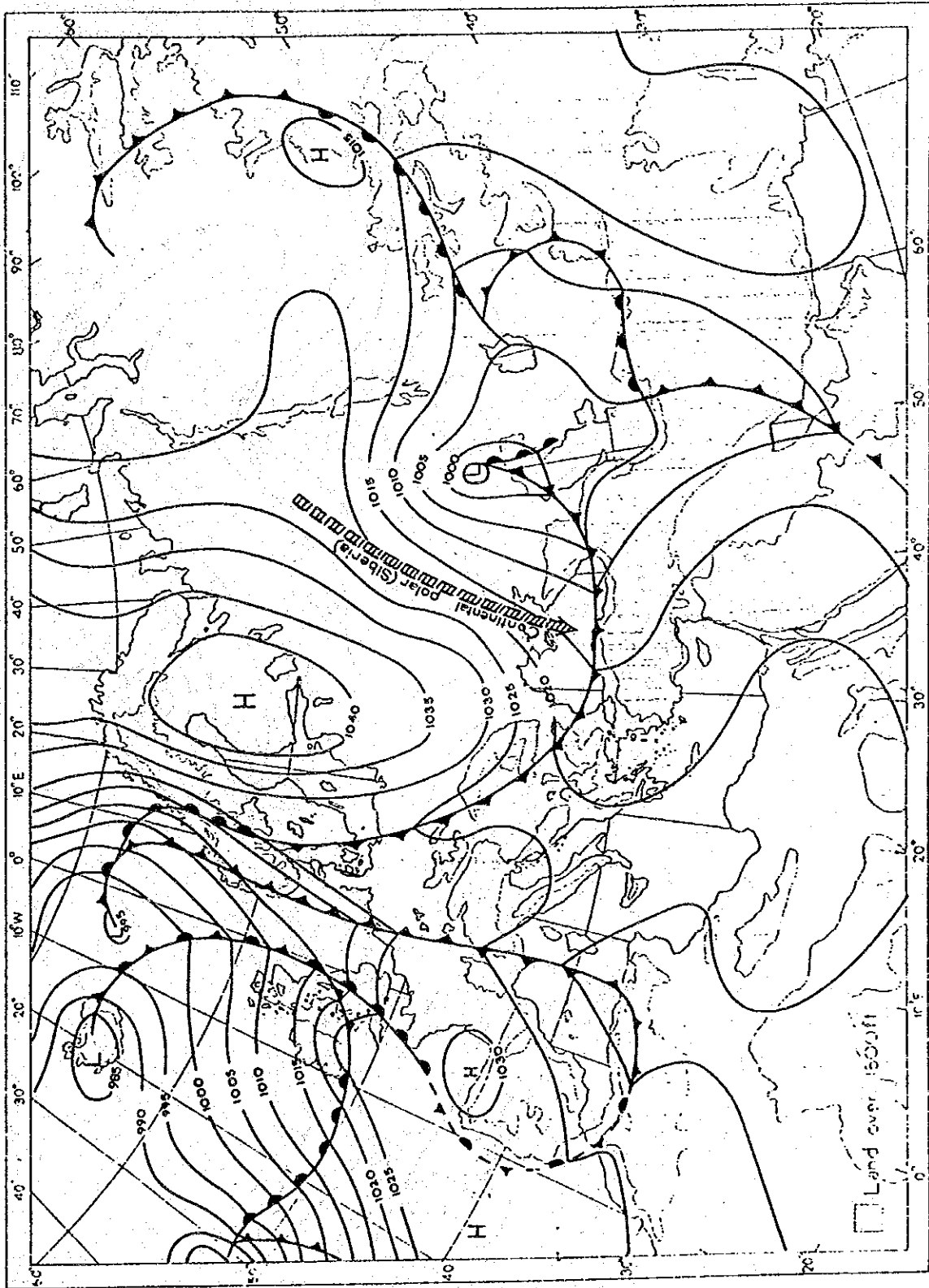


Fig. A5-1-3 Synoptic Chart : SE(W) type

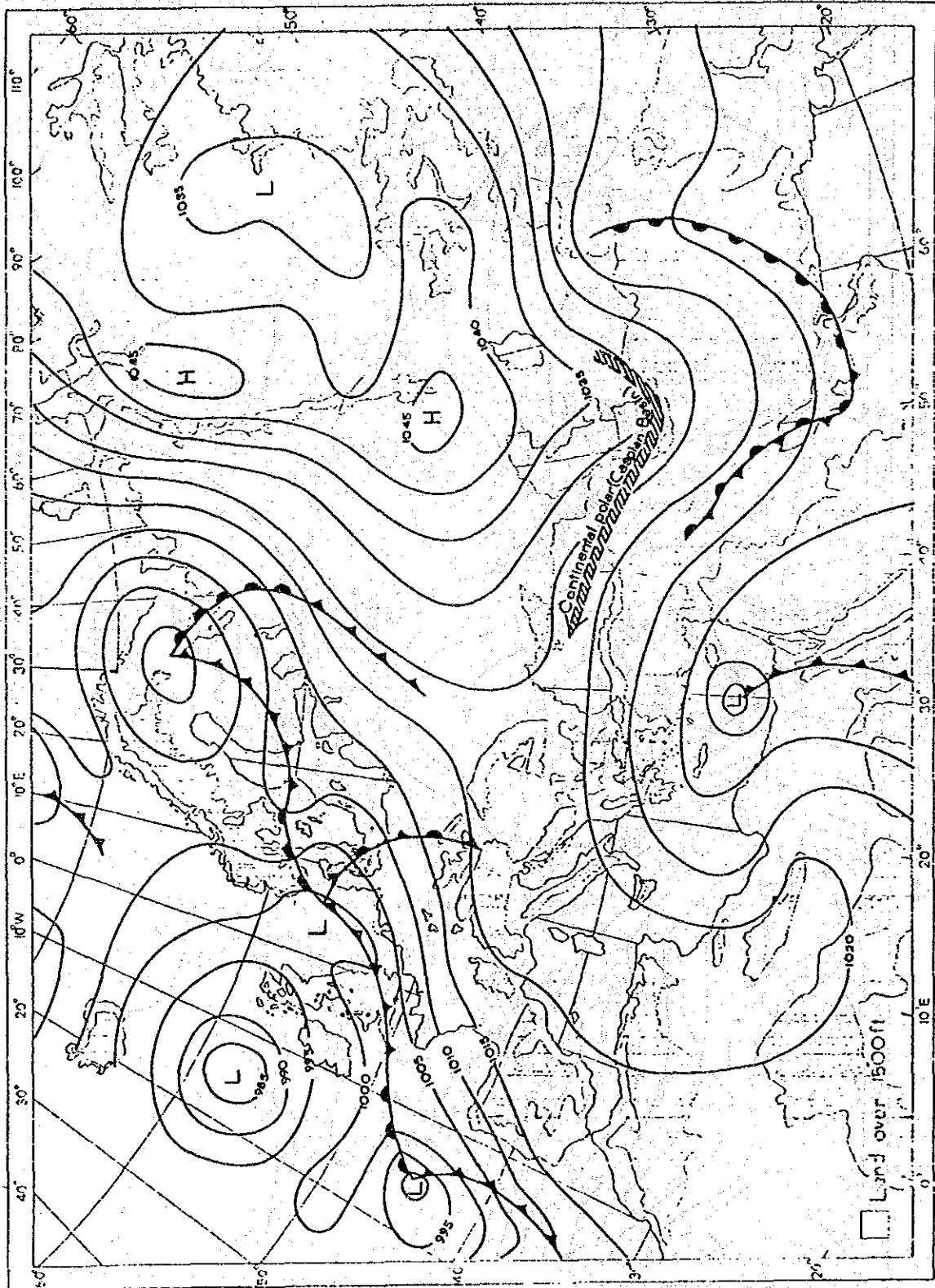


Fig. A5-1-6 Synoptic Chart : W(W) type

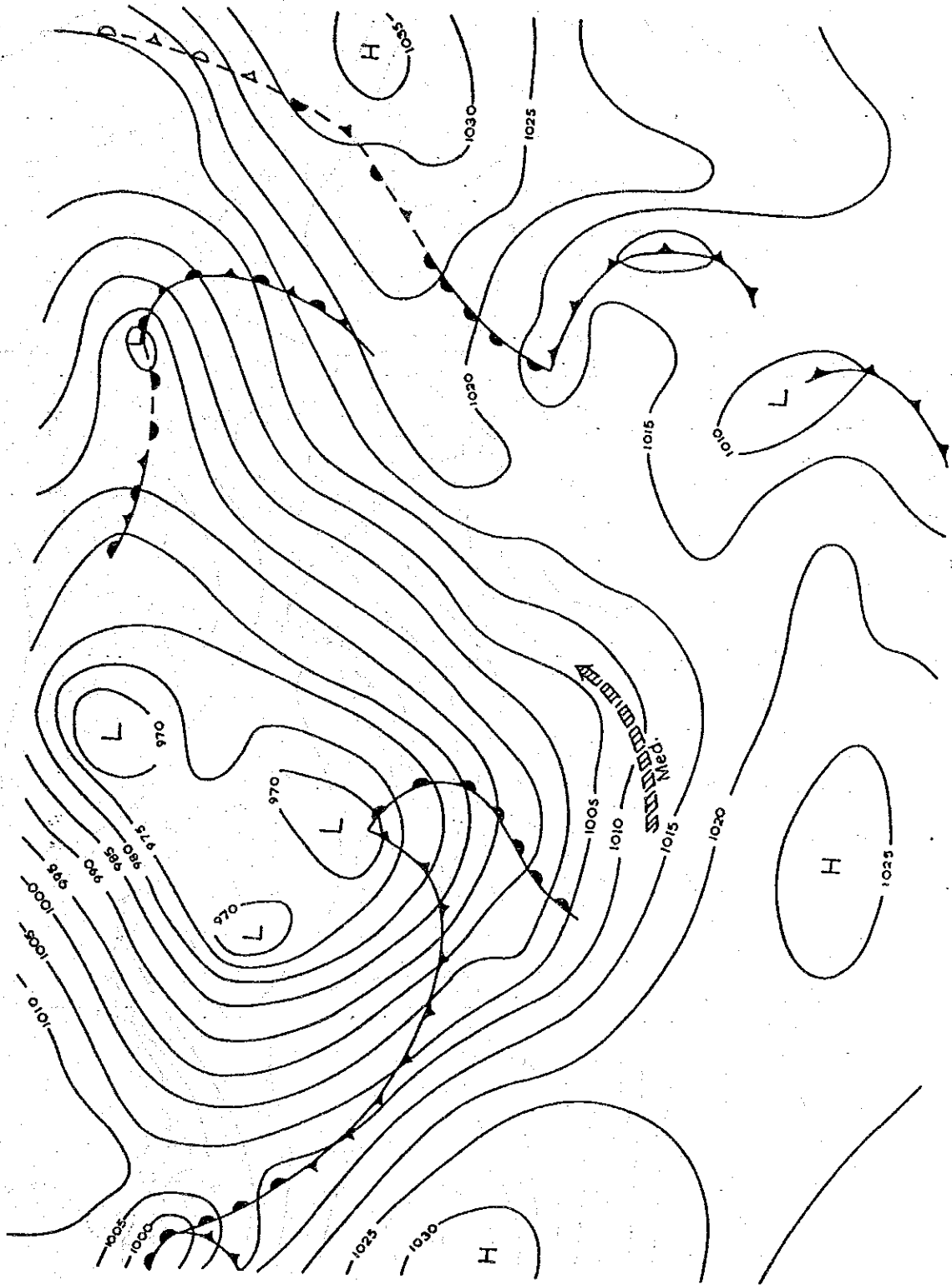


Fig. A5-1-7(a) Synoptic Chart : NW(W) type

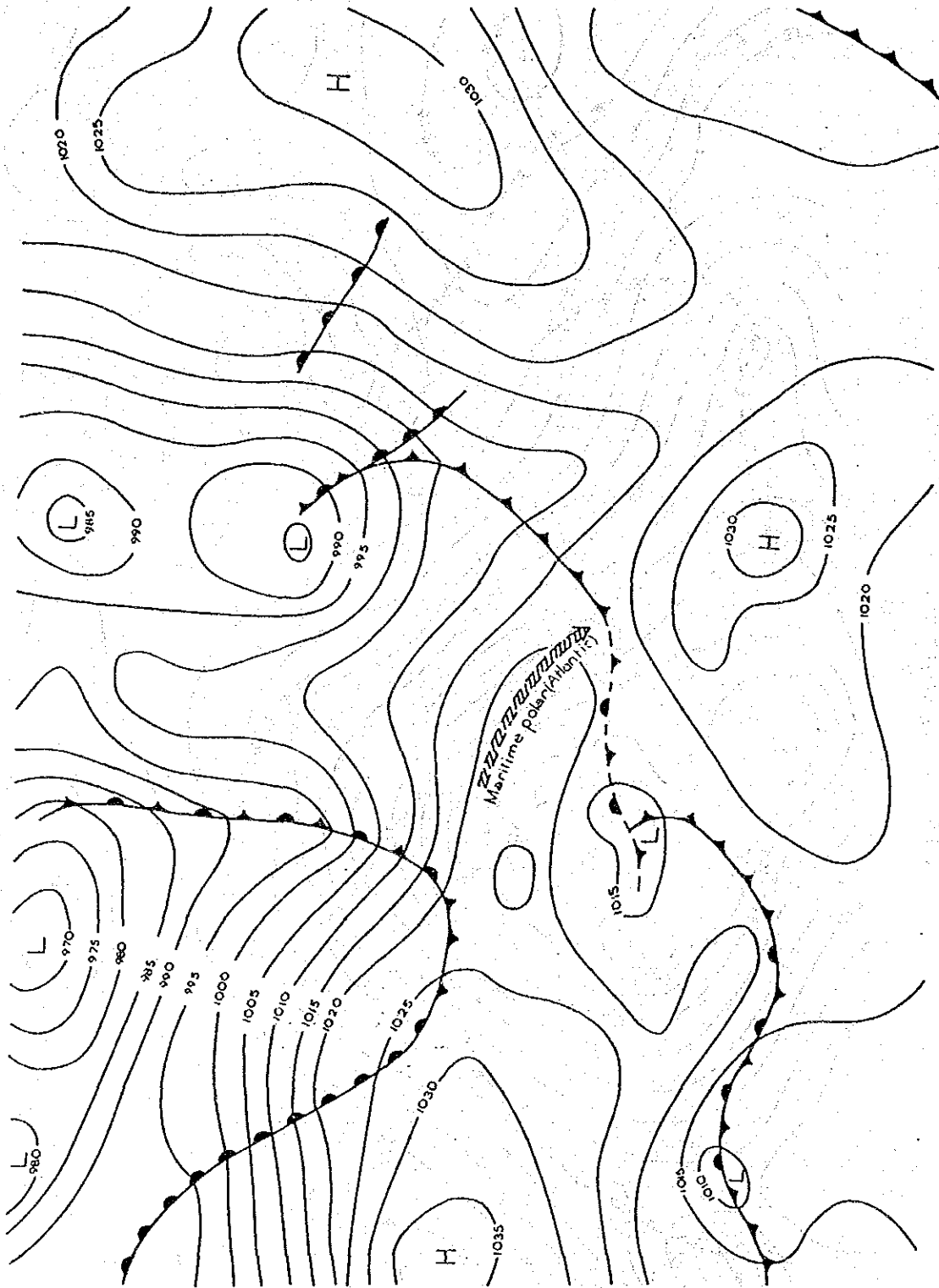


Fig. A5-1-7(b) Synoptic Chart : NW(W) type

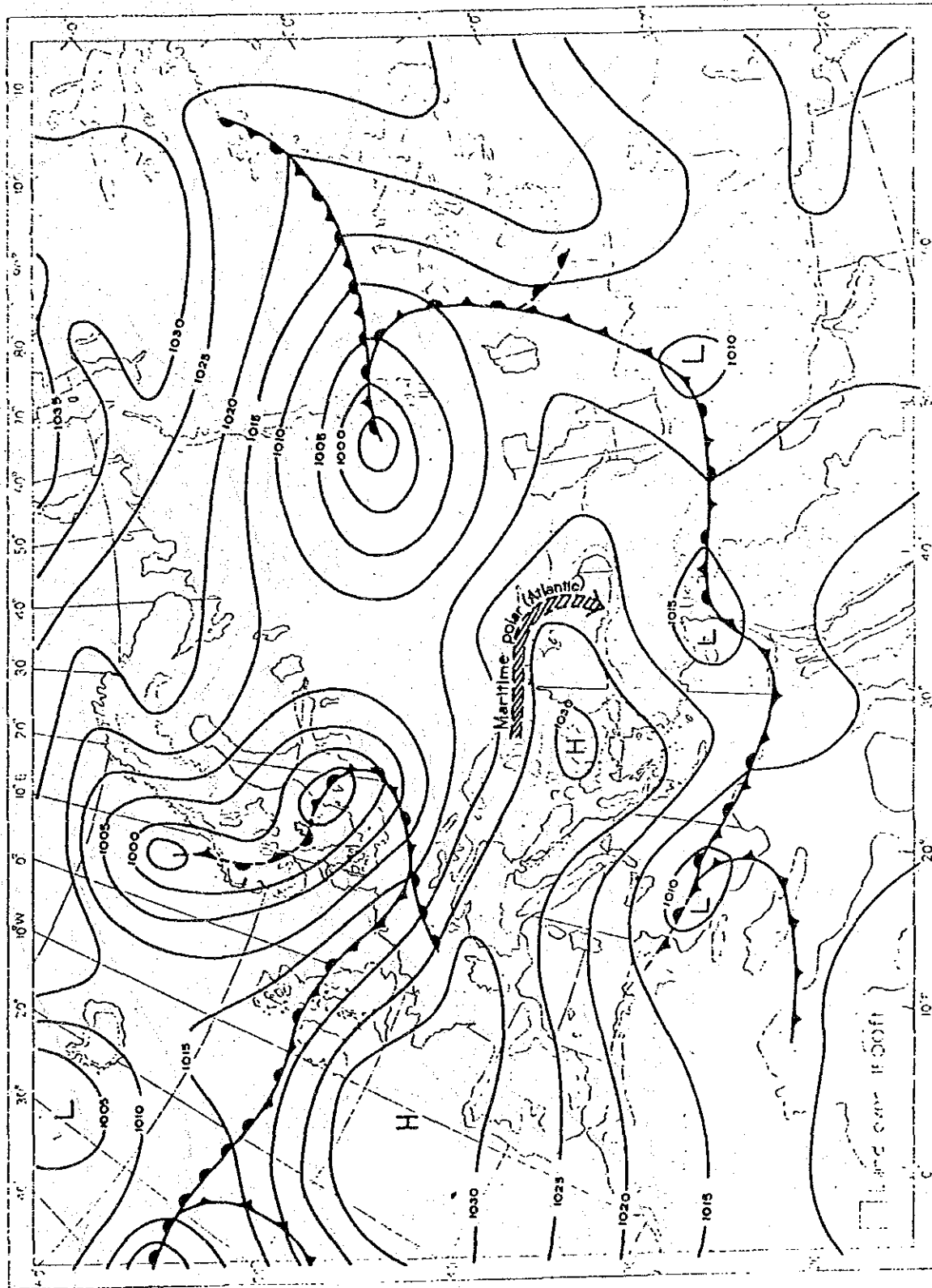


Fig. A5-1-7(c) Synoptic Chart : NW(W) type

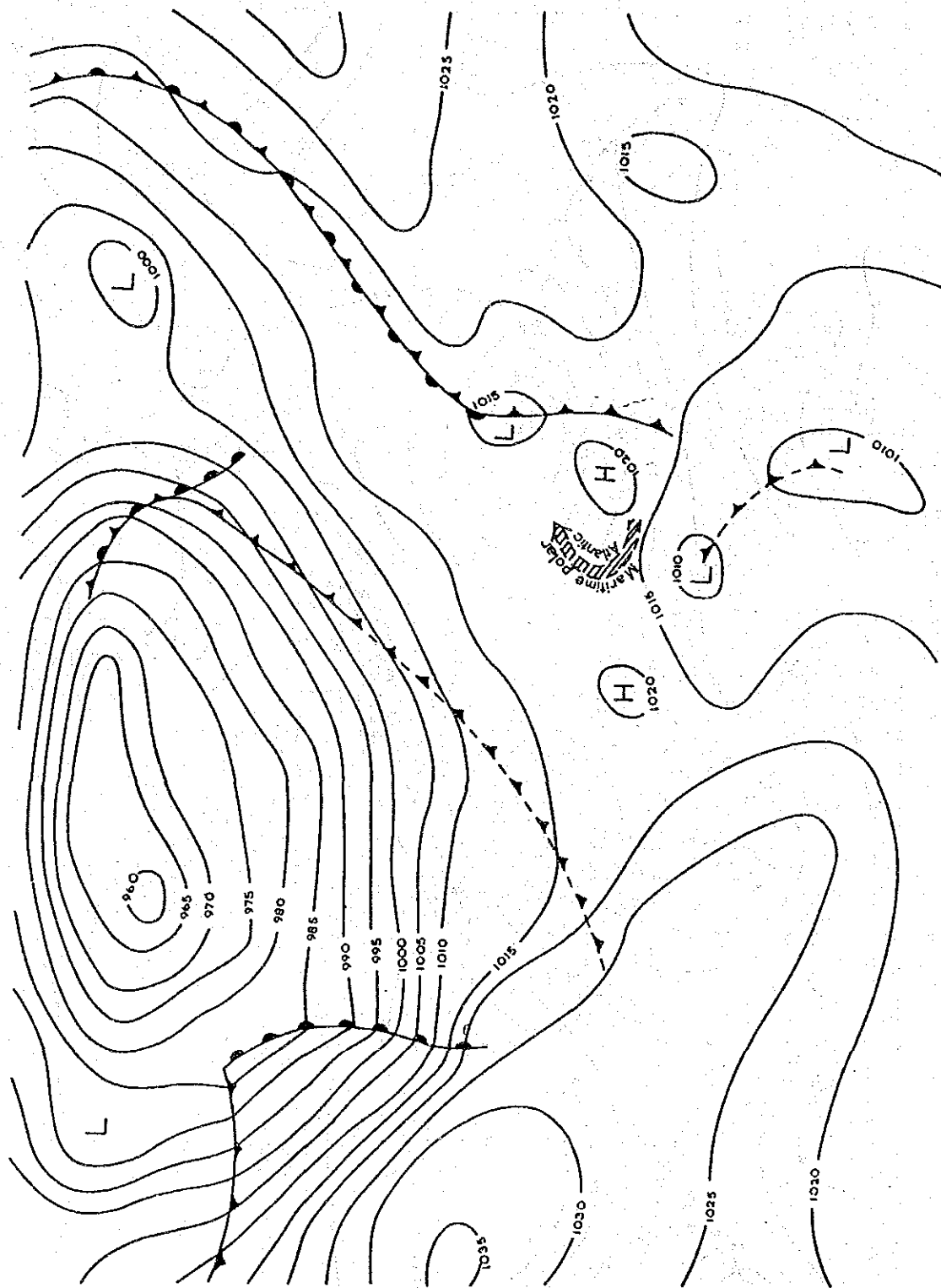


Fig. A5-1-9 Synoptic Chart : N(S) type

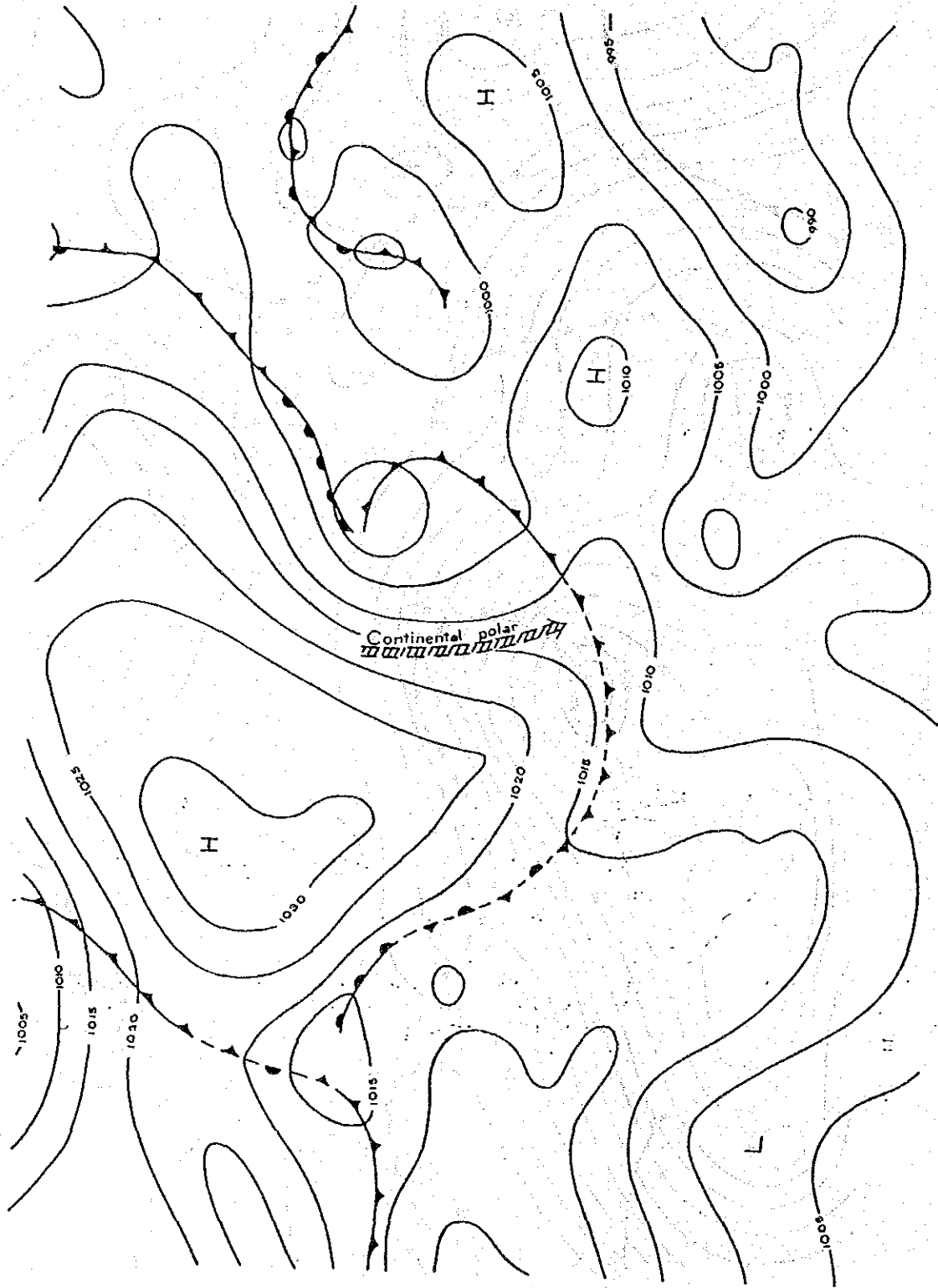


Fig. A5-1-10. Synoptic Chart : E(S) type

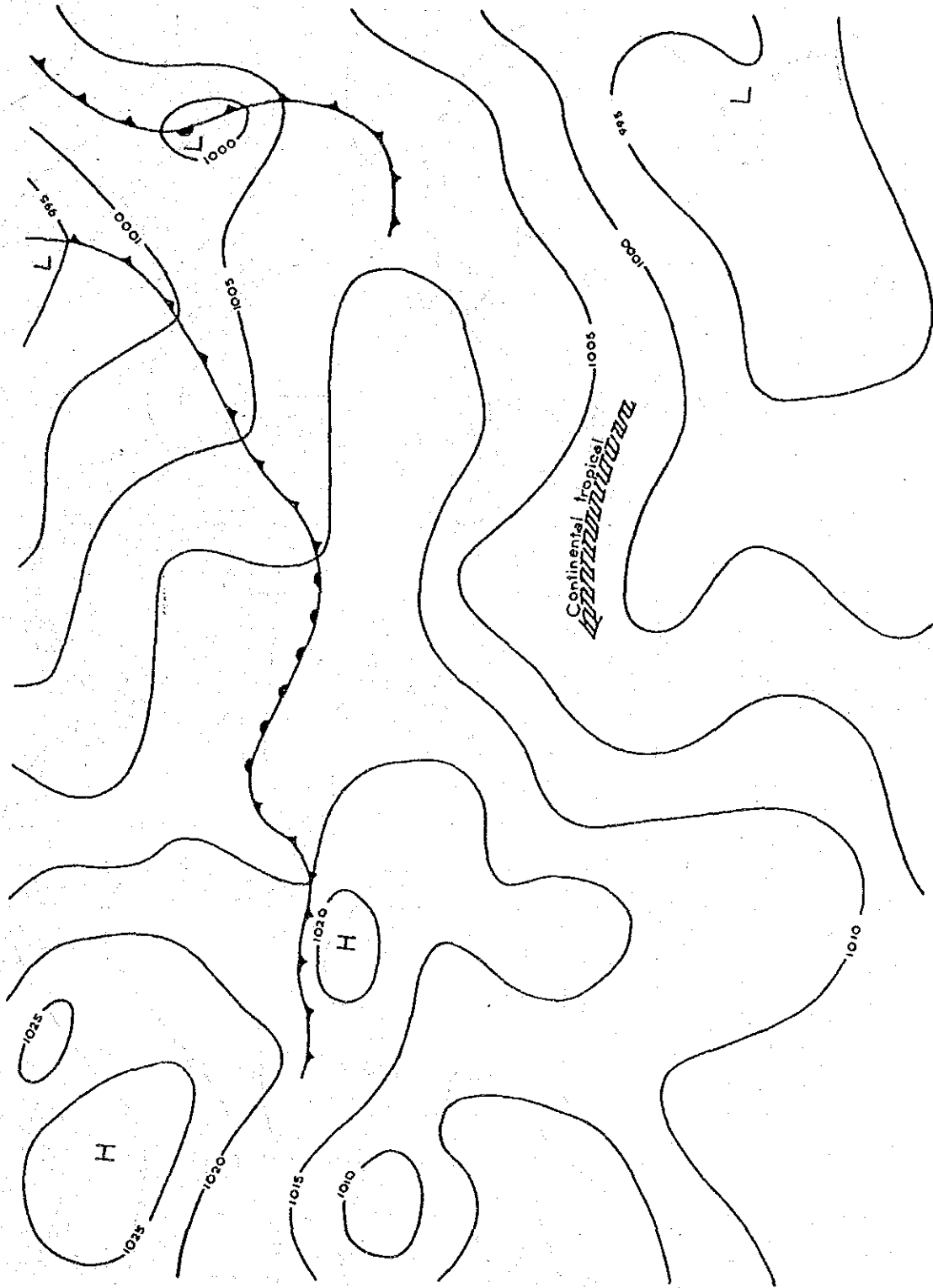


Fig. A5-1-11 Synoptic Chart : W(S) type

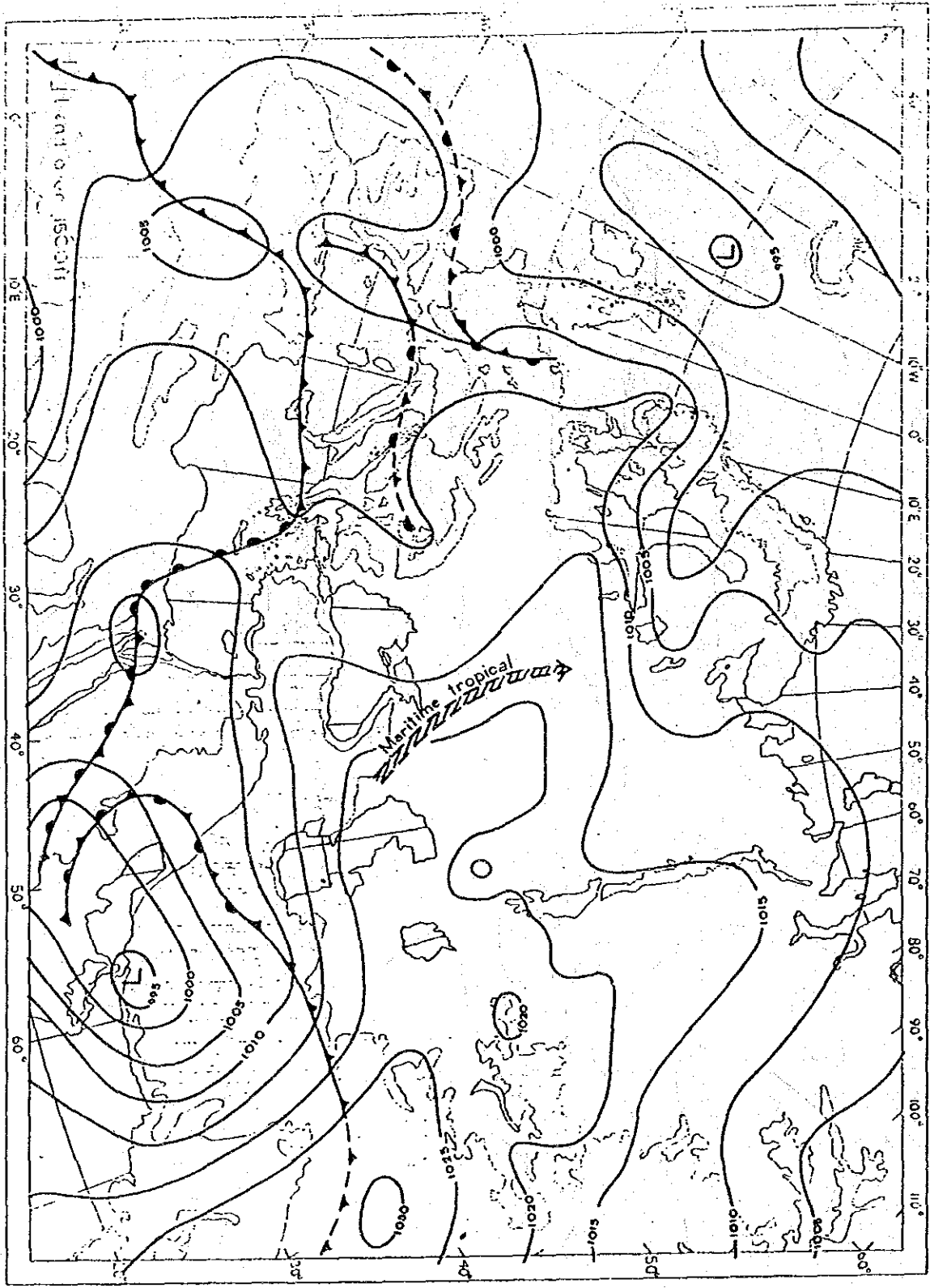


Fig. A5-1-12 Synoptic Chart : NW(S) type

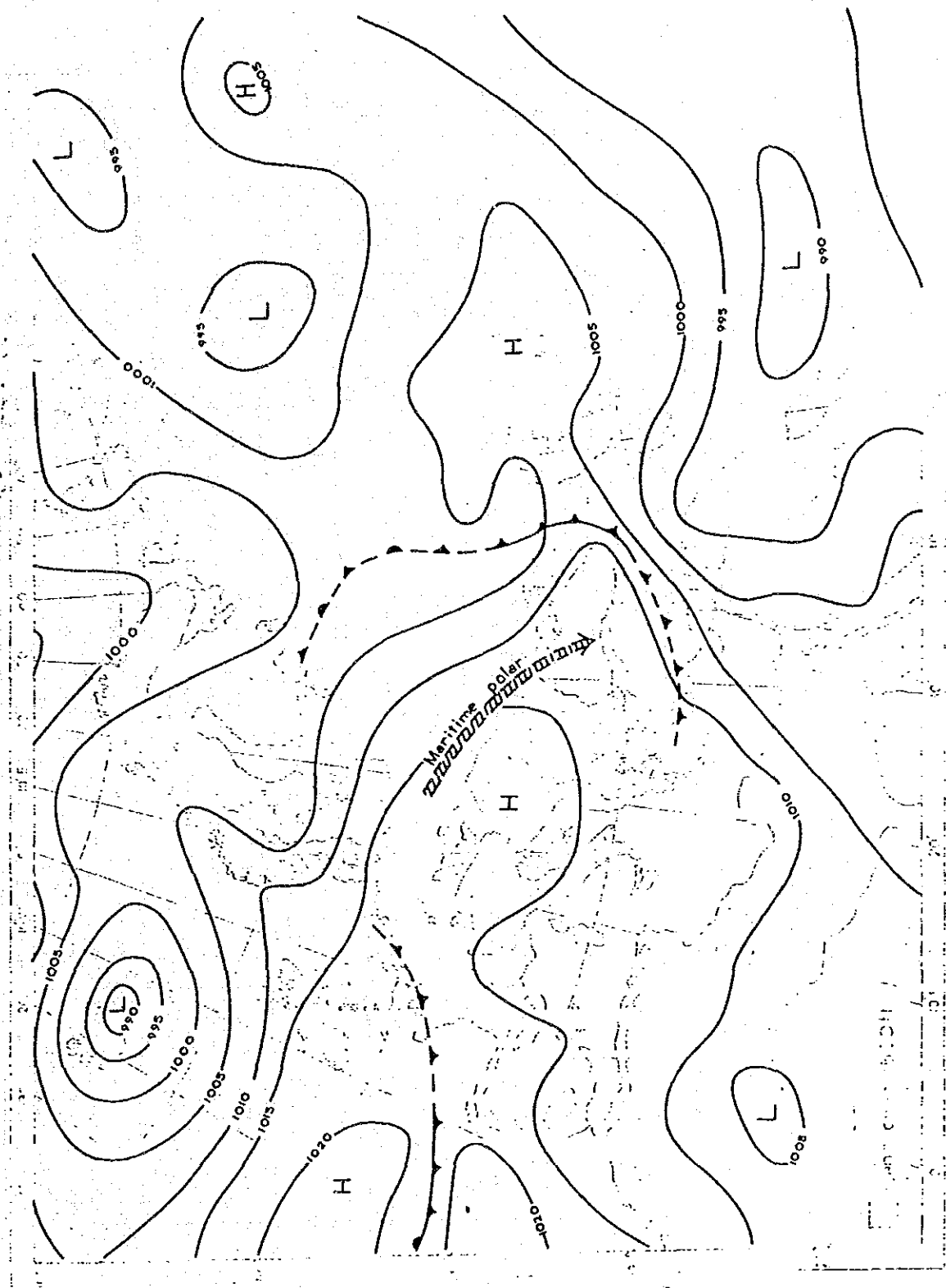


Table A5-1-1(a) Average Atmospheric Pressure (Zonguldak, mb)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1938	999.2	999.2	998.9	996.4	997.4	998.8	993.8	992.8	997.7	999.7	1003.6	997.9	998.0
1939	998.1	1002.8	993.2	998.8	995.9	994.3	995.7	994.3	997.9	997.4	1002.1	999.6	997.5
1940	998.9	998.2	998.9	997.7	997.8	994.3	994.5	996.5	999.9	1000.4	1000.0	997.8	997.9
1941	997.7	995.3	998.9	995.7	996.1	997.0	994.8	995.6	1000.2	1000.6	1004.5	1001.9	998.2
1942	997.2	998.1	1001.7	999.6	997.8	996.1	996.9	996.8	1000.0	1000.4	999.6	1007.1	999.2
1943	997.7	1006.5	1004.5	999.2	997.2	997.7	995.7	997.2	999.6	1001.5	1001.8	1004.6	1000.3
1944	1002.8	994.1	994.2	1000.0	1000.2	995.7	994.3	997.7	1000.9	998.2	998.1	1002.2	998.2
1945	995.9	1004.4	1004.5	999.5	999.6	998.5	996.1	993.5	998.5	1002.3	1000.9	999.2	999.4
1946	1007.9	995.9	998.1	999.9	995.1	997.2	995.7	994.8	994.3	1000.1	1000.5	977.2	998.6
1947	999.1	997.3	998.9	1003.5	998.3	995.7	994.5	995.6	1000.1	1003.2	998.3	996.6	998.4
1948	998.6	1000.1	1004.8	997.4	996.6	994.1	996.2	995.9	999.5	1003.7	1005.7	1009.3	1000.1
1949	1004.2	1005.5	998.5	1001.3	992.4	996.0	995.3	997.2	1000.9	1003.3	1000.3	998.8	1000.0
1950	1001.1	1002.0	999.3	994.5	996.4	997.9	995.0	996.0	997.5	1000.1	999.6	992.4	998.2
1951	992.6	999.5	995.4	998.0	995.2	995.4	995.2	995.6			1001.0	1003.6	998.2
1952	1000.0	996.0	996.9	1001.6	999.0	999.4	998.0	997.6			998.7	1000.4	998.9
1953	997.9	997.3	1005.9	999.4	997.3	996.0	998.2	998.2	1001.8	1004.6	1007.6	1009.2	1001.1
1954	998.2	999.5	1000.8	999.5	996.8	996.4	995.3	995.1	999.6	1001.5	1001.5	1000.6	998.7
1955	1002.2	994.9	998.3	999.4	1000.7	998.0	994.3	995.9	999.3	999.6	1001.9	999.5	998.7
1956	1000.4	996.7	1001.8	996.3	1000.4	998.4	997.6	997.0	1002.4	1004.2	1003.0	1005.6	1000.3
1957	1005.2	1002.0	1001.9	999.4	996.0	999.3	996.2	997.1	998.6	1003.4	1003.6	1001.1	1000.3
1958	999.7	1001.0	995.1	997.6	1000.0	996.3	996.6	996.8	1001.1	1003.8	1006.9	1000.0	999.6
1959	998.7	1010.0	1004.3	998.7	997.6	997.9	994.4	996.3	1000.8	1004.4	1004.2	1000.3	1000.7
1960	1000.4	1002.4	1000.4	998.1	999.3	998.6	995.8	996.8	1000.4	1000.8	1000.8	1000.8	999.6
1961	1003.8	1005.2	1003.2	998.2	996.3	997.4	997.3	998.5	1002.0	1003.3	1001.6	998.1	1000.4
1962	1003.3	999.5	995.3	999.2	998.1	998.9	796.9	998.4	1000.0	1002.4	1003.4	997.5	999.4
1963	999.5	996.0	1000.5	997.3	995.8	997.6	997.6	996.9	1000.5	1002.9	1002.8	1003.9	999.2
1964	1010.6	1000.3	999.4	999.2	999.5	996.5	996.9	997.3	1000.1	1004.6	1001.8	1003.0	1000.8
1965	999.6	997.0	1001.7	995.3	997.3	978.3	997.6	997.7	1001.5	1004.3	1000.1	997.3	993.9
1966	996.3	999.6	998.5	995.7	1000.3	998.4	995.4	995.6	1000.4	1000.7	1002.0	997.2	998.3
1967	1002.4	1003.8	1000.1	991.8	997.3	999.3	998.2	997.8	998.8	1002.2	1002.9	998.3	999.9
1968	994.7	1001.4	1001.0	1001.2	999.8	998.6	997.5	995.6			998.6	998.6	999.1
1969	999.8	998.1	997.9	999.4	999.1	994.2	998.6	997.3	1001.1	1005.8	1002.6	996.4	999.1

Table A5-1-1(b) Average Atmospheric Pressure (Zonguldak, mb)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1970	1000.3	995.1	999.5	998.6	996.7	998.6	995.2	996.3	1000.6	1005.6	1001.1	1004.1	999.4
1971	1003.1	997.1	996.5	998.3	996.2	996.7	996.2	996.8	1000.6	1000.9	1003.8	1012.6	1000.8
1972	1005.3	1004.6	1002.6	994.2	997.6	996.4	994.7	996.5	1000.0	1000.9	1003.9	1004.4	1000.6
1973	1006.4	996.3	1001.9	996.7	1000.0	999.3	995.1	1000.1	1001.4	1001.9	1003.9	1004.4	1000.6
1974	1005.8	1000.7	1000.7	996.6	996.2	995.7	998.0	997.2	999.9	999.4	1003.1	1002.1	999.7
1975	1003.6	1003.4	997.9	997.0	997.0	995.1	995.0	996.0	1001.4	1002.7	1003.5	1005.0	999.8
1976	997.7	1006.2	1001.4	997.0	999.3	999.4	995.6	998.3	1000.0	1000.1	1002.4	1000.5	999.8
1977	1003.6	1000.6	1004.7	996.7	1000.0	996.2	996.6	997.6	1001.2	1006.3	1000.7	1001.3	1000.7
1978	1001.7	997.3	997.8	996.3	998.3	997.4	998.9	998.9	997.6	1002.8	1009.5	999.1	999.6
1979	998.4	998.7	999.4	997.7	999.0	997.9	999.0	995.6	1002.1	1002.4	1000.8	1000.7	999.3
1980	1002.8	1002.7	997.3	986.7	996.6	996.4	995.6	998.0	1002.1	1000.5	1001.6	1000.1	999.2
1981	995.2	1000.2	998.5	999.7	998.8	998.5	996.8	999.0	1000.5	1002.0	1001.2	994.7	998.8
1982	1000.5	1004.0	1002.7	997.0	1001.6	998.4	997.2	997.4	1002.7	1002.0	1007.0	1002.2	1001.3
1983	1005.2	1000.9	1002.8	998.4	996.6	998.5	995.9	998.3	1000.0	1004.3	1002.1	1004.1	1000.6
1984	1000.7	1004.3	996.6	996.6	997.4	998.3	997.6	998.4	998.3	1004.2	1001.9	1006.6	1000.1
1985	997.7	999.8	1002.9	996.2	997.1	997.4	999.4	996.5	1002.0	1004.3	1000.5	1003.2	999.8
average	1000.9	1000.1	999.8	998.1	997.9	997.1	996.2	996.7	1000.0	1002.0	1002.2	1001.4	999.4

Fig. A5-1-13(a) Mean Temperature Distribution, January (°F)

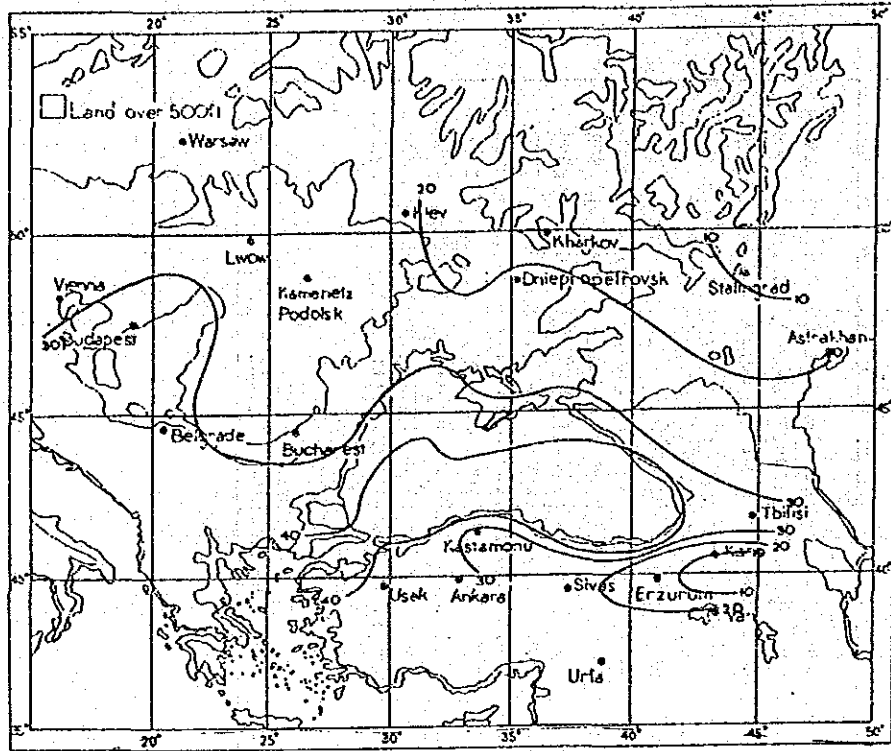


Fig. A5-1-13(b) Mean Temperature Distribution, May

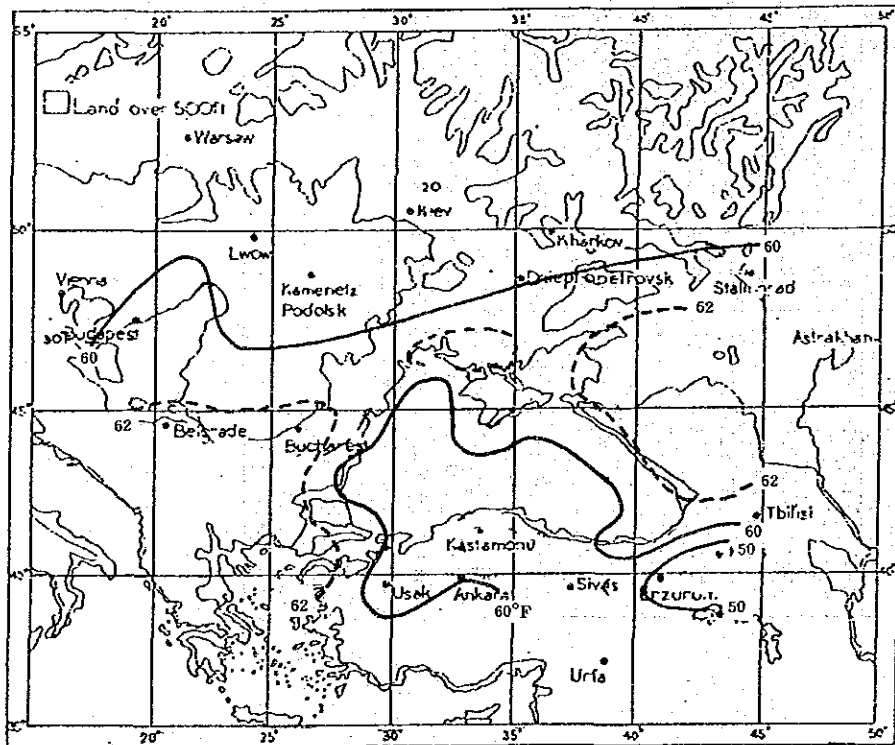


Fig. A5-1-13(c) Mean Temperature Distribution, July

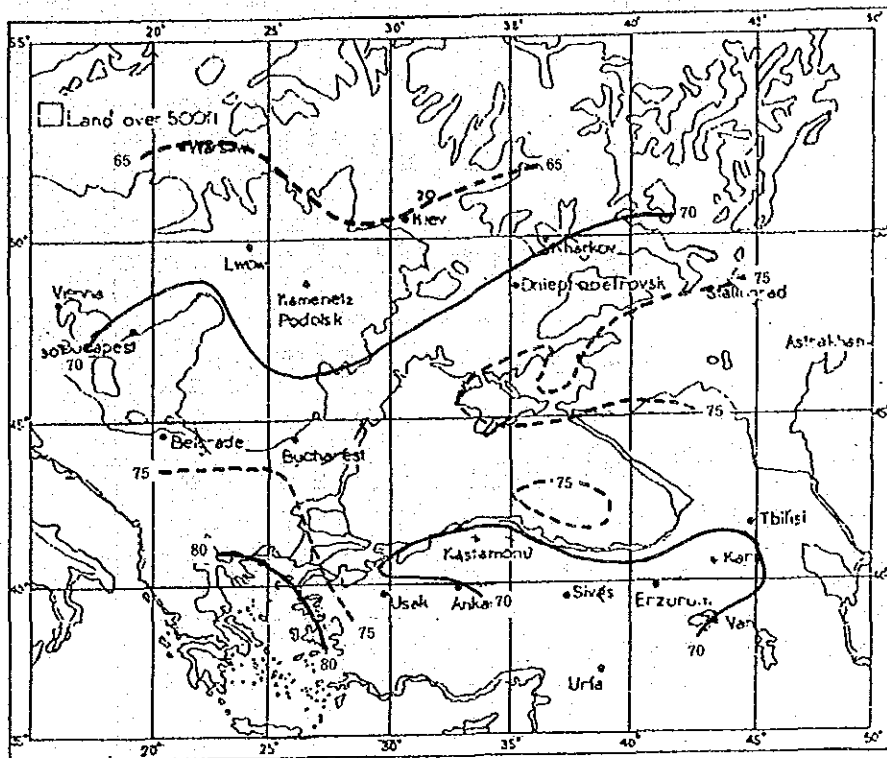


Fig. A5-1-13(d) Mean Temperature Distribution, September

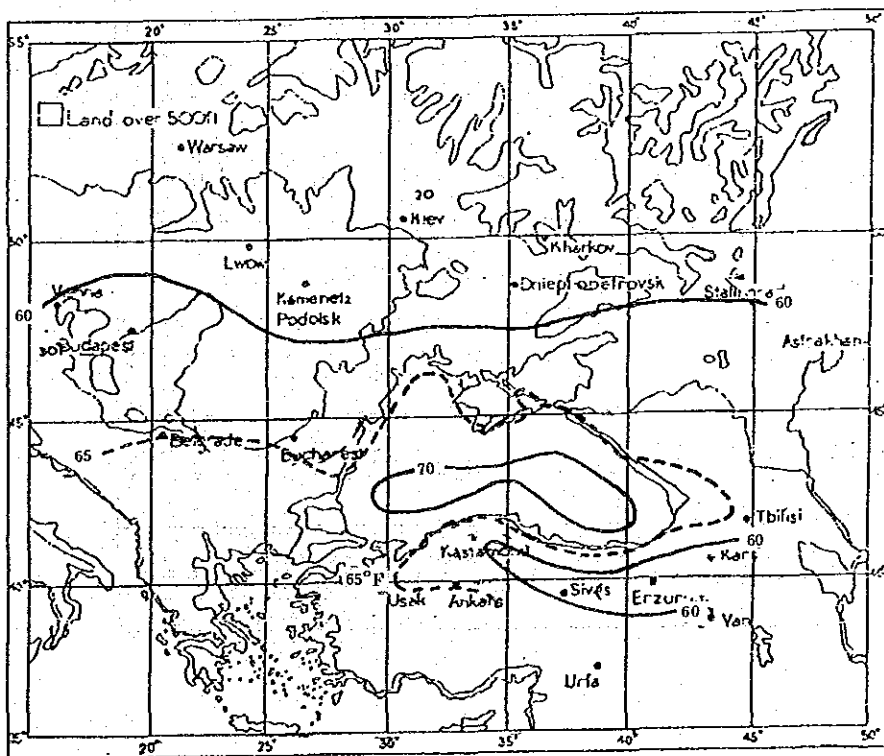


Table A5-1-2(a) Average Temperature (Zonguldak, °C)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1937	4.2	7.3	13.3	12.3	15.1	19.4	23.3	23.1	22.0	15.8	12.3	10.5	14.9
1938	6.1	5.3	6.1	10.3	14.9	18.7	23.0	23.7	19.2	15.0	10.4	9.3	13.5
1939	8.4	5.0	7.7	10.9	17.3	20.1	22.8	22.2	17.7	16.5	9.4	8.6	13.9
1940	4.2	6.1	7.3	9.8	13.6	18.8	22.7	20.9	17.5	14.9	12.3	7.6	13.0
1941	7.1	9.4	7.2	12.3	16.4	19.2	21.1	21.0	16.3	13.8	8.4	4.4	13.0
1942	2.9	5.5	3.5	8.8	14.5	19.9	20.8	20.9	17.7	14.9	10.2	5.5	12.1
1943	4.3	3.4	4.4	9.6	14.5	17.8	20.1	20.5	18.3	16.8	13.0	8.4	12.6
1944	4.8	8.4	7.6	9.4	13.1	18.9	21.5	19.8	17.8	16.4	12.4	8.0	13.2
1945	6.3	3.6	5.7	9.6	16.2	17.8	20.8	22.6	17.8	13.8	10.7	8.0	12.7
1946	4.7	6.4	6.3	9.2	14.3	19.9	21.9	22.3	20.1	13.0	13.8	7.8	13.3
1947	2.6	7.8	11.6	11.4	14.5	19.6	22.6	20.7	17.4	12.6	12.1	11.1	13.7
1948	10.5	4.3	4.3	9.6	15.3	19.6	21.1	21.4	17.7	14.4	8.4	3.4	12.5
1949	4.5	3.0	5.9	7.8	15.2	19.5	20.3	19.5	16.4	13.3	14.5	9.2	12.4
1950	1.9	6.2	6.9	14.6	15.4	19.5	21.4	20.3	20.1	14.5	11.8	12.2	13.7
1951	8.0	7.9	10.1	12.8	16.7	19.3	21.9	22.3	19.0	11.6	12.6	6.9	14.1
1952	8.1	6.9	8.2	10.2	18.9	17.6	20.5	22.9	20.7	17.3	13.8	12.5	14.4
1953	8.6	6.5	3.9	10.6	14.1	20.1	21.5	22.0	18.0	14.4	7.6	4.5	12.7
1954	2.4	2.4	7.2	8.9	16.4	21.3	22.8	22.6	20.4	16.2	13.1	8.4	13.5
1955	9.6	11.6	8.6	9.2	14.7	18.4	21.9	21.2	19.5	18.3	11.0	9.0	14.4
1956	1.8	4.7	4.0	12.3	14.6	18.8	20.9	21.7	16.9	19.1	9.7	6.7	12.7
1957	4.5	8.0	6.2	10.2	13.7	19.2	22.0	22.6	20.9	15.8	11.5	8.1	13.6
1958	6.8	11.1	7.7	10.9	17.2	20.2	21.2	21.7	17.3	14.2	11.5	10.5	14.2
1959	7.5	12.2	5.9	12.1	13.6	18.4	22.3	21.8	16.0	12.1	10.7	10.5	12.8
1960	8.0	6.7	6.5	8.8	14.9	18.4	21.2	21.0	17.2	19.1	19.2	13.2	14.1

Table A5-1-2(b) Average Temperature (Zonguldak, °C)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1961	5.6	4.6	8.0	13.4	16.7	28.3	21.5	21.8	17.1	14.4	14.6	9.2	13.9
1962	7.1	5.3	10.9	10.8	17.2	19.0	21.1	22.0	19.1	16.0	16.1	8.8	14.4
1963	5.6	9.7	6.3	8.8	14.2	19.3	22.3	22.5	19.5	15.7	13.0	8.0	13.8
1964	2.5	4.1	7.0	11.7	13.0	19.5	20.8	20.2	17.7	16.6	11.0	10.0	12.8
1965	6.9	4.0	7.0	10.0	15.7	20.8	30.9	19.6	18.6	12.4	12.9	10.8	13.9
1966	7.5	10.2	8.5	13.3	16.0	19.0	23.4	22.6	18.5	18.4	15.9	9.5	15.2
1967	5.3	3.4	6.5	11.6	16.0	18.8	22.0	22.2	18.7	15.6	11.0	9.5	13.4
1968	5.3	6.6	7.2	12.1	16.8	18.6	21.8	20.8	19.0	13.9	12.5	8.0	13.5
1969	1.7	7.8	6.2	9.8	16.3	21.4	19.8	21.9	19.2	13.7	13.6	11.1	13.8
1970	8.3	8.9	9.8	14.6	15.8	18.9	22.6	31.6	17.6	13.9	12.6		12.4
1971	9.9	6.3	9.0	10.6	16.6	20.1	21.8	21.9	18.6	13.5	12.3	7.3	14.0
1972	3.5	4.7	6.5	14.2	15.2	20.5	23.2	22.6	19.2	15.0	11.2	5.8	13.5
1973	4.6	8.7	6.1	11.1	16.0	18.7	22.1	20.5	18.4	15.5	9.2	7.8	13.2
1974	2.9	6.8	6.3	10.0	15.9	19.6	21.2	20.6	18.6	18.5	11.5	7.9	13.3
1975	6.6	4.9	10.5	13.4	14.9	20.6	22.7	21.6	19.0	14.9	10.0	5.3	13.7
1976	5.6	2.8	4.8	11.1	13.2	18.0	21.7	20.0	18.2	15.3	12.2	8.6	12.6
1977	6.4	11.4	7.5	10.5	14.9	19.2	21.5	22.5	18.1	12.2	13.7	6.2	13.7
1978	5.5	8.9	8.4	11.1	16.2	19.3	20.9	20.0	18.0	14.6	9.3	8.7	13.4
1979	8.0	7.5	10.3	12.9	15.4	20.3	21.0	22.0	19.0	14.1	12.5	9.4	14.4
1980	4.4	4.8	6.5	10.0	16.3	20.0	21.2	21.4	17.0	16.7	13.5	9.5	13.4
1981	7.4	6.3	8.5	10.6	13.7	20.2	21.5	21.6	18.7	17.2	10.4	11.8	11.0
1982	5.7	3.6	6.0	10.6	13.3	20.0	20.1	20.8	19.7	15.2	10.0	10.1	12.9
1983	5.1	6.2	8.4	13.1	17.0	18.9	22.1	20.5	18.5	13.7	9.7	8.7	13.5
1984	8.2	6.0	8.1	8.3	17.4	19.1	20.6	19.6	19.7	15.9	11.5	6.4	13.4
1985	7.5	1.6	5.1	12.2	16.9	18.9	19.6	21.3	17.1	12.4	12.7	8.9	12.8
average	5.9	6.4	7.2	11.0	15.3	19.4	21.6	21.5	18.4	15.0	11.9	8.5	10.5

Table A5-1-3(a) Highest Temperature (°C, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1937	29	10	21	15	27	14	1	3	24	10	5	19	3, VIII
	20.0	19.0	29.0	24.0	23.0	27.0	29.0	30.0	27.0	25.0	21.0	23.0	30.0
1938	-	-	-	24.8	24.2	27.8	27.8	33.2	31.2	29.0	22.8	18.7	14, VIII
	28	14	28	24	5	13	25	9	24	29	17	7	5, V
1939	18.8	15.5	23.6	28.8	31.8	27.0	30.2	30.2	27.8	28.6	17.4	22.4	31.8
	19	16	29	14	31	1	17	23	12	30	19	8	17, VII
1940	18.0	19.4	31.7	22.0	28.8	31.4	37.2	27.8	25.9	29.4	22.5	24.2	37.2
	17	18	29	7	30	1	17	5	1	27	6	17	17, VII
1941	20.6	21.3	20.4	26.8	32.6	31.8	36.0	33.0	29.6	27.8	26.6	18.2	36.0
	9	26	29	24	1	22	14	14	29	10	7	9	22, VI
1942	17.0	20.2	16.9	24.2	25.8	40.5	30.6	25.5	25.4	25.8	21.9	14.4	40.5
	3	17	31	21	9	5	8	6	1	9	13	1	9, V
1943	19.0	11.8	15.4	22.3	31.6	24.4	28.4	26.6	27.5	25.0	25.8	21.4	31.6
	6	5	1	1	21	22	24	2	9	20	11	11	24, VII
1944	17.5	19.4	26.0	24.2	26.2	27.7	29.9	26.4	24.8	26.6	26.8	23.2	29.9
	29	15	30	23	27	29	30	21	27	6	11	8	21, VIII
1945	19.2	14.0	17.7	22.5	36.7	28.4	27.1	39.8	30.6	23.8	25.5	19.0	39.8
	12	22	5	27	23	15	21	22	7	7	18	6	15, VI
1946	14.6	18.7	18.6	22.8	22.0	28.8	28.2	27.9	26.8	26.9	27.9	22.6	28.8
	27	26	7	2	21	3	31	27	3	1	16	3	3, VI
1947	16.8	22.4	26.8	26.8	24.9	28.9	28.4	25.9	25.5	21.7	22.2	24.5	28.9
	8	24	23	10	22.25	22	2	13	21	19	9	1	13, VIII
1948	21.2	16.9	17.5	21.5	29.9	27.8	30.8	31.2	24.2	25.6	24.2	10.6	31.2
	13	28	21	8	14	13	19.20	19	1	3.4	17	11	13, VI
1949	16.0	14.8	23.3	23.2	26.8	31.1	25.8	27.2	22.2	20.9	26.8	18.5	31.1
	18	12	31	19.20	26	23	6	4	3	27	1	7	4, VIII
1950	15.0	19.5	24.0	29.0	30.1	28.4	26.4	34.3	31.8	25.4	24.3	22.2	34.3
	14	27	15	13	10	10	17	14	20	1	13	10	10, VI
1951	17.2	23.4	22.6	28.2	29.2	32.2	27.8	27.2	26.9	20.5	23.2	17.2	32.2
	13	3	31	2	8	15	20.21	21	28	4	10	4	2, IV
1952	20.2	16.8	30.2	33.4	27.0	27.9	25.2	32.0	29.9	26.6	25.2	21.6	33.4
	2	16	27	10	31	28	30	2	12	11	6	31	10, IV
1953	18.8	22.2	17.5	29.0	28.0	26.8	28.8	27.0	27.3	22.7	16.3	14.3	29.0
	31	3	28	30	19	5	31	7	23	12	6	8	31, VII
1954	14.8	15.4	23.1	25.2	27.3	27.9	30.8	29.8	29.8	26.0	23.6	19.6	30.8
	18	18	28	1	23	10	27	4	17	25	1	21	10, VI
1955	21.4	25.3	24.4	26.7	26.7	31.8	30.8	27.8	31.3	28.6	20.6	20.6	31.8
	19	14	14	23	21	20	16	24	1	6	3	2	24, VIII
1956	21.2	18.5	21.5	29.8	26.1	29.0	30.0	35.4	25.9	25.5	25.1	25.7	35.4
	25.3	17	19	14	29	21	15	9	14	1	11	14	29, V
1957	17.8	23.4	21.1	28.6	30.4	27.3	28.2	29.5	29.3	24.8	25.8	24.0	30.4
	8	28	1	1	18	28	5	24	12	17	15	15	24, VIII
1958	18.3	25.2	28.8	23.2	33.1	35.2	34.0	36.0	24.2	25.7	21.6	21.4	36.0
	4	21	31	18	23	15	16	1	17	30	3	4	3, XI
1959	21.2	11.5	17.3	26.6	28.8	25.3	28.8	27.5	25.4	28.0	29.8	20.7	29.8
	13	19	30	30	21	11	22	14	1	26	7	9	14, VIII
1960	19.6	23.9	23.0	24.4	30.8	27.6	27.6	32.6	26.9	31.7	26.5	22.8	32.6
	6	3	22	19	20	3	15	16	9	1	15	1	20, V

Table A5-1-3(b) Highest Temperature (°C, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
	6	3	22	19	20	3	15	16	9	1	15	1	20. V
1961	17.5	16.4	27.3	28.2	31.5	26.2	26.5	27.7	28.3	22.5	29.2	23.1	31.5
	31	1	15	8	15	28	5	16	9	28	16	15	15. V
1962	18.6	19.2	26.2	25.8	34.3	27.0	27.6	27.8	27.4	23.6	26.0	19.7	34.3
	8	5	22	1	18	16	16	19	6	5	7	22	19. VIII
1963	20.2	23.1	23.6	20.1	24.6	29.0	27.4	33.8	27.0	28.9	25.4	28.0	33.8
	31	20	29	4	30	4	31	18	2	14	13	1	4. IV
1964	14.3	17.2	20.3	32.0	30.2	25.9	27.8	28.2	25.9	31.6	22.4	21.4	32.0
	22	2	3	22	30	6	6	12	13	1	22	31	6. VII
1965	19.9	18.2	24.2	27.9	27.0	30.2	35.2	26.0	32.6	22.0	24.9	21.1	35.2
	1	23	19	17	9	3	8	6	8	30	2	14	8. VII
1966	20.9	22.8	21.8	26.4	28.8	28.2	31.6	28.2	24.0	30.2	25.5	21.4	31.6
	7	27	31	15	19	12	17	11	6	6	3	13	17. VIII
1967	18.6	14.2	23.1	26.4	27.9	26.4	28.0	27.6	25.0	26.5	25.8	23.5	28.0
	1	25.26	11	30	1	1	19	13	19	16	18	19	19. VII
1968	18.0	20.0	19.2	25.6	25.2	29.5	32.9	29.6	31.6	23.8	22.4	22.0	32.9
	17	15	17	23	20	7	12	18	16	2	27	6	7. VI
1969	17.5	18.7	20.6	25.0	32.6	35.0	28.8	33.3	26.1	21.7	23.8	22.7	35.0
	7	16	28	12	12	12	11	11	5	4	4	11	11. VIII
1970	22.3	21.4	25.8	33.4	30.9	28.2	31.3	34.7	24.2	26.3	25.5	21.6	34.7
	1	17	22	28	12	12	31	28	18	16	12	2	12. VI
1971	23.0	17.0	25.2	24.0	29.6	34.0	27.9	27.6	25.2	25.0	22.6	19.6	34.0
	11	13	29	25	28	19	13	19	17	10	25	2	19. VIII
1972	12.2	16.4	19.6	28.0	25.9	31.6	28.8	33.3	32.0	26.1	21.6	12.2	33.3
	29	26	14	11	23	25	24	20	24	22	27	14	24. VII
1973	15.9	21.2	22.8	25.0	28.9	32.6	34.0	25.8	25.7	32.8	20.0	19.8	34.0
	1	20	19	15	9	30	20	2	26	16	1	15	16. X
1974	8.6	20.8	17.2	20.4	29.0	31.9	32.0	27.3	26.6	34.1	25.2	17.0	34.1
	30	14	31	3	31	1	2	29	8	19	20	18	2. VII
1975	15.4	15.9	27.4	31.9	27.2	30.2	34.8	28.6	26.1	26.2	26.8	17.4	34.8
	27	14	8	26	7	17	6	6	2-17	14	1	5	26. IV
1976	18.6	15.2	15.2	28.5	21.0	27.0	28.0	26.9	27.6	28.3	26.9	24.4	28.5
	30	14	31	1	23	20	6	2	22	3	26	30	2. VIII
1977	19.0	25.1	26.2	26.7	26.4	28.0	29.3	39.0	27.5	25.8	25.5	18.2	39.0
	30	14	19	14	2	13	20	9	1	2	27	30	13. VI
1978	17.4	23.6	21.4	26.6	32.2	35.3	29.6	32.3	29.6	23.4	19.3	22.4	35.3
	30	13	30	28	5	18	23-1	27	24	16-30	19	12-1C	24. IX
1979	24.1	26.0	24.4	29.8	22.0	28.8	27.3	29.4	30.3	24.4	26.3	19.4	30.3
	1	1	23	22	31	28	12	9	1	11	28	2	31. V
1980	16.4	15.7	24.2	23.4	35.6	34.4	28.7	27.6	25.3	26.9	24.0	21.9	35.6
	5	4	19	25	5	19	1	13	15	24	9	24	19. VI
1981	18.0	16.7	29.9	27.3	22.5	30.6	28.2	26.4	23.8	25.8	20.4	20.4	30.6
	2	25	31	15	24	28	7	6	11	10	18	18	28. VI
1982	23.0	19.4	23.7	26.7	21.2	32.0	25.5	26.5	28.3	27.2	24.7	22.0	32.0
	31	11	26	1	2	20	25	12	18	7	28	23	2. V
1983	16.1	24.3	27.3	26.6	30.1	28.2	30.0	29.4	26.4	23.2	22.7	16.6	30.1
	5	10	3	3	17	8	17	11	26	6	31	27	8. VI
1984	18.1	18.3	25.2	17.0	31.6	33.2	31.7	25.4	32.5	29.4	23.3	16.3	33.2
	9	12	19	11	23	9	29	1	24	5	14	5	9. VI
1985	20.4	20.7	18.5	30.4	25.2	32.1	28.3	29.8	25.2	19.0	24.6	20.0	32.1
average	24.1	26.0	31.7	33.4	36.7	40.5	37.2	39.8	32.6	34.1	29.8	28.0	40.5

Table A5-1-4(a) Lowest Temperatine (°C, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1937	27	2	4	8	9	2	3	30	30	22	15	28	27. I
	-4.0	-3.0	2.0	2.0	7.0	9.0	15.0	15.0	14.0	7.0	6.0	0.0	-4.0
1938	-	-	-	2.0	6.5	10.0	16.5	16.4	9.0	7.5	4.0	2.4	8. IV
	4	5	7	13	2	5	11	26	27	12	28	24	2.0
1939	1.2	-0.8	-1.3	1.0	9.3	9.2	16.0	15.0	9.5	8.6	1.5	-1.0	7. III
	13	1	4	2	3	14	5	20	7	22	28	31	13. I
1940	-6.3	-2.2	-4.0	-2.6	3.0	11.3	15.0	12.7	10.7	5.8	4.6	0.4	-6.3
	30	11	19	14	8	4	1	28	26	16	17.29	31	31. XII
1941	-5.5	-1.3	-1.8	1.0	7.9	11.5	14.0	13.0	7.7	4.3	0.0	-7.4	-7.4
	5	23	22	19	8	8	6	3	18	22	27	12	5. I
1942	-7.7	-1.0	-4.0	0.3	6.0	10.4	12.4	13.4	11.3	4.4	1.1	0.0	-7.7
	30	1	6	5	22	3	1	25	15	30	30	21	30. I
1943	-4.4	-3.0	-2.8	1.0	5.2	10.0	12.5	12.5	10.3	9.7	5.8	1.2	-4.4
	17	26	30	2	4	18	1.2	28	19	9	20	27	17. I
1944	-4.0	-1.4	-1.2	1.1	4.3	10.9	13.7	10.0	8.5	9.8	4.0	-1.7	-4.0
	25	25	12	17	12	18	2	31	17	11	21	14	25. I
1945	-3.5	-3.0	-2.8	0.8	4.2	9.6	13.5	12.1	10.4	6.6	0.5	-1.5	-3.5
	24	17	14	3	12	17	5	30	30	28	24	20	20. XII
1946	-3.7	-2.5	-0.3	1.0	4.6	12.4	13.4	15.0	10.8	3.3	6.7	-4.8	-4.8
	25	2	18	15	1	2	1.2	31	30	20	10.11	26	2. II
1947	-6.4	-6.8	-0.5	2.3	6.2	9.5	14.6	12.5	11.4	3.4	4.0	0.1	-6.8
	26	22	2	5	1	26	30	1	25	13	29	27	29. XII
1948	1.0	-1.7	-1.7	1.2	9.1	13.0	13.0	13.1	11.5	4.6	-2.6	-2.6	-2.6
	25.27	8	12	12	2	24	1.3	28	27	6	23	26	8. II
1949	-3.0	-4.0	-2.5	0.0	4.0	11.5	13.8	10.5	10.0	7.7	8.0	0.7	-4.0
	13	4	18	3	13	5	10	31	1.26	15	29	30	4. II
1950	-6.8	-8.0	0.0	5.5	5.5	10.7	5.3	13.0	14.2	6.2	2.8	2.5	-8.0
	21.22.23	19	4.11.22	18	1	3	23	2	24	30	29	14.15	14.15. XII
1951	0.0	1.5	3.0	4.2	8.6	10.4	15.2	17.1	10.4	4.0	3.5	-0.6	-0.6
	7.8	29	1	13	11	7	9	29	12	30	13	11	1. III
1952	0.0	-1.0	-3.0	2.7	6.6	10.2	13.8	16.4	13.0	10.0	6.1	3.4	-3.0
	23	27	7	1	4	7	1	25	8	30	28	28	7. III
1953	17	-30	-3.7	22	5.8	13.7	14.3	15.2	8.9	7.6	-32	-25	-3.7
	13	6	19	2.5	16	10	23	29	26	4	22.23.29	27	6. II
1954	-5.2	-5.5	1.1	1.6	9.2	12.7	15.9	16.4	13.4	8.2	5.5	0.5	-5.5
	27	16	17	6.21	25	1.6	4	1.2	21	29	29	1	1. XII
1955	0.7	0.5	0.3	3.5	5.7	11.2	15.5	16.4	12.0	10.9	2.3	-0.3	-0.3
	31	8	24	10	7	2	4	16	26	19	10	10	31. I
1956	-5.4	-2.6	-1.1	0.6	8.8	9.6	14.0	14.4	7.8	5.3	-2.3		-5.4
	4	3	28	4	2	1	5	25	20	10	21	3	3. II
1957	-0.4	-2.4	-2.1	2.0	6.6	10.7	13.7	15.4	14.2	8.6	3.0	0.4	-2.4
	6	1	15	11	3	9	11	31	30	28	29	4	6. I
1958	-2.9	-0.7	0.0	3.4	7.1	9.0	12.5	13.5	10.3	5.4	2.5	0.0	-2.9
	20	13	4	26	1	7	9	7	30	15	30	18	13. II
1959	-0.2	-2.4	-0.5	3.9	6.0	9.2	15.5	16.5	7.5	4.4	2.3	2.4	-2.4
	25	6	9	6	5	2	6	23	26	6	20	2	6. II
1960	-1.0	-7.0	-1.8	2.7	6.6	11.0	13.4	13.8	9.6	10.5	6.1	5.0	-7.0
	22	28	1	14	5	9	12	19	23	16	22	23	22. I

Table A5-1-4(b) Lowest Temperatine (°C, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1961	22 -5.5	28 -4.0	1 -2.1	14 4.9	5 9.1	9 14.4	12 15.4	19 14.7	23 9.1	16 8.2	22 1.2	23 -2.6	22. I -5.5
1962	7 -0.7	21 -1.3	11 -1.2	4 23	5 7.0	8 9.4	11 14.1	24 14.4	16 12.5	22 7.5	7 8.8	26 -0.3	21. II -1.3
1963	17 -4.4	26 -0.5	6 -2.4	5 1.1	5 7.1	2 11.5	6 15.3	30 13.8	23 10.6	22 7.6	23 3.7	25 -1.0	17. I -4.4
1964	18.19 -5.6	9 -4.0	14 0.1	16 1.6	21 6.7	2 13.5	10 12.8	5 13.7	24 10.9	31 6.8	24 1.2	25 2.2	18.19. I -5.6
1965	9 -0.2	8 -5.6	12 -0.3	3 0.0	3 6.4	5.6 13.2	18 13.6	21 13.5	30 10.2	18 6.0	27 0.9	17 0.5	8. II -5.6
1966	8 -0.9	6 -2.6	22 -0.6	2 3.6	4 6.1	14 11.0	4 16.0	31 14.4	22 11.5	9 12.4	30 8.0	13 -1.2	6. II -2.6
1967	18 -5.8	17 3.5	27 0.0	21 2.0	17 8.8	5 9.8	21 15.5	26 15.0	9 11.8	12 10.0	27 -0.3	23 -4.0	18. I -5.8
1968	15 -6.6	21 -0.8	14 -1.5	2 4.8	31 12.3	7 11.0	1 12.4	3 14.5	30 10.9	23 8.2	1 3.2	16 1.2	15. I -6.6
1969	28 -5.5	13 -1.7	24 0.0	11 -0.4	7 6.2	29 11.8	18 13.7	7 13.0	28 10.0	30 7.0	30 4.9	18 4.2	28. I -5.5
1970	11 0.2	18 -1.0	29 0.0	1 5.6	6.28 3.0	2 12.4	20 16.2	27 14.0	30 5.9	31 6.0	8 7.0	10 0.6	18. II -1.0
1971	15 -1.0	8 -2.2	13 -1.0	3 3.8	10 9.8	8 13.5	7 15.8	29 14.0	30 11.6	20 4.0	27 5.7	21 0.9	15. I -2.2
1972	14 -6.0	22 -3.8	2 -2.3	2 3.7	2 9.5	18 15.2	14 16.8	29 16.8	16 12.3	30 4.1	4 2.0	17 0.6	14. I -6.0
1973	17 -5.2	1 1.1	30 -1.4	5 3.0	15 7.3	1 12.2	30 16.3	24 14.8	18 11.6	29 4.9	26 1.0	21 0.0	17. I -5.2
1974	11 -4.1	10 -2.0	1 1.8	23 3.6	8 9.7	14 12.4	30 14.1	16 14.8	13 11.0	31 8.6	27 3.0	22 0.4	22. XII -4.1
1975	21 0.0	9 -1.9	6 0.6	2 6.8	2 7.7	12 12.0	4 15.8	11 14.0	25 11.6	26 7.8	25 -0.3	14 -2.4	9. II -2.4
1976	4 -5.0	7 -7.2	3 -2.4	22 3.0	4 7.6	7 9.6	20 15.1	19 14.5	28 11.6	19 8.4	29 0.6	6 0.3	6. XII -7.2
1977	18 -1.5	23 0.5	15 -1.5	11 3.7	6 7.3	5 9.9	1 14.4	20 14.0	30 9.2	24 4.3	10 6.0	10 -1.7	18. I -1.7
1978	4 -1.4	21 -0.7	2 2.8	20.24 2.6	3 6.5	7 9.6	7 12.6	31 14.0	18 11.0	26 8.5	29 3.2	15.27 1.5	4. I -1.4
1979	30 -4.6	29 -1.5	1 0.4	14 4.2	14 8.5	16 10.6	24 14.0	28 14.4	30 9.0	6 3.4	22 3.6	10 0.0	30. I -4.6
1980	7 -4.2	18 -1.0	3 -1.1	1 2.2	1 1.0	3 12.9	4 14.0	31 13.2	20 11.5	18 7.8	12 3.6	22 1.9	18. II -4.2
1981	9 0.2	3 -2.8	9 1.0	24 0.4	5 4.0	1 4.0	3 15.0	1 12.6	14 12.4	22 10.5	10 0.0	31 3.4	9. I -2.8
1982	2 -5.4	20 -1.5	5 -1.4	18 4.6	9 5.0	10 11.0	23 13.0	3 13.8	25 12.6	25 5.4	13 2.2	14 -0.3	20. II -5.4
1983	18 -2.6	13 -5.0	20 -3.2	23 4.4	1 8.9	15 10.8	11 13.7	30 13.0	28 10.0	18 7.7	13 1.8	14 -1.2	13. II -5.0
1984	17 0.6	23 -0.3	0 0.6	4 2.4	1 6.2	4 10.7	5 13.4	21 11.1	29 12.1	31 5.8	30 3.6	20 0.0	23. II -0.3
1985	-1.2	-7.0	-4.2	3.4	4.7	11.9	11.7	15.0	9.7	5.8	2.3	0.4	-7.0
average	-7.7	-8.0	-4.0	-0.4	3.0	9.0	12.4	10.0	5.9	3.3	-3.2	-2.4	-8.0

Table A5-1-5(a) Annual Number of Foggy Days (Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1931	7	5	3	1	2				1	2	1	1	23
1932			15	3		7			1			2	27
1933	12	6	10	2	3						1	2	37
1934	2			3	3						3	2	11
1935	9	3	7	9	8				1		2	5	44
1936	2	3	1	2	4						2	2	16
1937	1			1									2
1938			3	2	3							1	9
1939	1	1		5	4		1			1	1	1	15
1940	2	1		6	6	1							16
1941				5	1				1	1			8
1942	2	8	4	1	3	1				1			20
1943	1	1		2	6								10
1944		1	5	4	3	3							16
1945	1	1	1	4	1					2			10
1946			4	11	7								22
1947	2	3	2	4	2								13
1948				4	7				2			2	20
1949	3	1	5	4	6				1	1			22
1950	2	3	4	6	5								20
1951	1	1	6	4	6	1						1	20
1952	1	1		5	1	1							9
1953			1	9	12					1		2	26
1954	2	6	14	2			11					1	33
1955	5	1	9	4	8	2					2	4	35
1956	9	8	7	9	5	5	2				1		51
1957	2	5	4	11	18	8				2		4	58
1958	3	4	8	7	3	1					1	2	29

Table A5-1-5(b) Annual Number of Foggy Days (Zonguldak)

YEAR	M O N T H												ANNUAL	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
1959	1		5	6	19	1				1			7	41
1960	3	5	8	17	10	3	1							47
1961	1	1	2	8	4								5	21
1962	5	2	5	6		1					1		1	21
1963	8	5	3	15	11	1	1				2		3	49
1964	1	6	10	7	14	4	1		1		3		2	49
1965	7	4	13	8	5	1		1					1	40
1966	3	7	7	8	1	3	1							30
1967	1	2	7	6	7								2	23
1968		3	3	9	9	2								27
1969	7	1	1	4	11									24
1970	2	3	3	5										13
1971	3		2	7	2									14
1972		1	4	5	10									21
1973	2	3	6	8	4				2				1	26
1974		4	13	1		1								20
1975		3	6	3	7	1		1					3	23
1976		1	11	9	11									32
1977	1		4	5	5						1			16
1978	2	9	8	3										22
1979		3	4	1	3									11
1980		1	7	8	2						1			19
1981	2	3	1	1	1									8
1982	2	3	4	10	13								1	33
1983		2	3	6	2									13
1984	2	3	2	12	3									22
1985	5	1	8	4	5		3					4		30
average	2.3	2.5	4.9	5.7	5.2	0.9	0.3	0.3	0.1	0.3	0.5	1.1		24.3

Table A5-1-6 Monthly Precipitation (Zonguldak, mm)

Year	ANNUAL												
	1	2	3	4	5	6	7	8	9	10	11	12	
1931	112.2	110.8	115.4	102.5	77.1	404.5	50.5	190.1	247.2	111.7	302.0	146.2	1570.0
1932	100.0	210.7	97.7	115.1	27.2	112.4	49.7	145.9	11.6	41.1	249.0	119.0	1279.4
1933	95.2	131.3	66.0	94.7	78.3	37.0	159.7	51.8	151.8	146.1	87.2	233.7	1334.5
1934	75.5	51.6	4.9	3.0	69.2	37.0	99.3	121.3	124.3	237.6	141.9	136.7	1892.3
1935	112.3	78.4	53.0	30.9	34.5	39.1	48.0	3.2	234.7	157.8	106.0	78.7	982.5
1936	82.2	145.0	30.5	102.1	125.9	56.2	206.5	118.3	117.3	183.4	156.1	1552.2	
1937	247.0	76.0	16.5	53.8	55.5	9.5	41.0	121.0	59.0	254.3	137.8	46.6	1124.0
1938	191.2	115.6	98.0	130.5	65.2	58.7	58.6	21.0	155.4	39.6	103.8	126.2	1173.6
1939	96.1	120.2	99.3	27.4	14.8	28.0	58.8	119.3	145.6	80.8	192.7	167.2	1149.5
1940	163.8	104.8	119.3	44.3	119.3	58.2	40.8	158.3	67.0	112.8	75.6	318.8	1320.8
1941	115.6	43.3	90.2	34.8	101.1	29.9	71.3	46.1	104.4	110.4	210.3	156.0	1106.0
1942	129.1	49.4	73.6	81.3	55.3	24.8	24.1	155.3	159.6	133.1	252.2	48.5	1186.8
1943	201.9	38.5	40.9	299.0	48.2	46.9	19.3	11.5	34.5	288.5	147.9	230.1	1497.3
1944	163.0	79.2	185.4	35.6	49.4	89.3	84.8	26.9	19.0	79.7	210.1	174.2	1125.6
1945	160.5	117.0	111.6	77.6	2.6	123.9	28.6	5.4	42.2	189.8	79.4	93.3	1029.9
1946	73.3	196.5	148.0	30.1	66.8	47.5	35.7	21.2	23.2	254.2	102.0	127.5	1125.4
1947	237.3	99.6	67.2	43.8	16.6	37.5	83.3	83.3	53.6	250.4	208.6	98.0	1216.8
1948	112.4	379.5	204.8	50.8	63.1	139.3	33.3	14.4	19.2	223.4	135.4	47.2	1471.9
1949	125.8	179.0	94.2	155.6	22.1	67.2	149.6	27.4	168.7	16.9	24.6	149.1	1180.2
1950	265.4	72.5	117.2	45.1	28.3	53.1	57.8	49.2	23.5	411.1	218.8	45.3	1378.9
1951	128.4	79.2	125.6	130.8	17.1	135.9	95.2	45.9	96.1	71.8	111.3	239.8	1308.9
1952	127.9	96.1	74.0	21.2	70.3	79.5	18.7	4.5	72.1	129.7	91.8	47.2	856.5
1953	111.7	137.2	158.9	53.4	68.3	73.0	10.1	122.3	133.8	135.2	170.4	87.7	1254.6
1954	215.3	80.1	28.8	86.9	57.2	169.9	110.4	37.9	5.8	98.6	168.7	77.8	1111.4
1955	90.1	35.1	77.6	56.3	29.9	20.1	104.5	638.9	43.7	223.6	173.7	119.3	1662.9
1956	204.4	115.4	130.1	78.1	52.8	86.6	49.9	8.1	168.3	143.3	196.3	99.3	1326.3
1957	69.6	99.2	54.1	21.5	101.5	0.2	9.9	43.0	66.4	93.0	118.2	282.5	929.1
1958	194.9	72.6	182.8	80.6	25.9	150.5	89.0	24.4	139.9	50.4	61.9	152.9	1195.3
1959	216.7	134.0	68.7	59.2	25.3	49.6	36.9	100.9	171.3	62.2	110.3	61.0	1087.7
1960	162.4	106.6	98.0	76.0	90.9	101.8	45.9	222.3	63.9	170.5	127.9	113.9	1374.6
1961	211.0	185.6	119.2	39.3	104.3	109.5	38.2	53.0	90.4	100.3	156.5	119.9	1301.2
1962	110.5	204.9	144.2	54.3	18.3	85.8	102.8	5.4	139.5	84.4	65.3	251.3	1267.2
1963	205.6	35.1	180.1	97.5	49.1	90.9	39.4	56.6	152.0	153.3	96.9	232.3	1398.4
1964	92.5	169.7	111.5	51.9	81.3	95.3	72.6	182.3	227.3	15.4	159.0	156.9	1327.7
1965	94.5	189.1	84.4	111.0	28.0	47.0	190.9	30.4	3.9	137.8	200.4	187.3	1305.5
1966	161.1	33.4	144.9	34.0	25.2	30.0	12.4	174.3	15.3	65.4	37.7	173.3	907.4
1967	249.8	67.3	145.9	43.1	67.0	21.7	19.7	92.4	74.3	137.6	248.8	134.5	1307.1
1968	191.3	57.7	116.7	48.7	42.7	26.7	4.3	100.6	252.0	137.3	169.6	98.8	1176.9
1969	136.6	106.1	61.3	186.8	58.0	60.0	26.9	1.9	6.2	38.9	94.9	159.3	890.4
1970	112.1	146.4	195.1	72.4	124.3	49.3	179.7	117.8	115.5	115.5	123.5	219.4	1481.5
1971	48.7	97.8	115.3	56.7	51.1	34.6	90.9	53.1	34.3	288.2	117.0	285.1	1193.3
1972	58.6	38.4	36.4	79.8	39.9	210.3	34.9	1.5	119.1	175.6	106.5	46.3	1063.9
1973	69.5	78.7	116.7	89.1	99.1	99.7	32.2	30.7	12.5	187.6	353.8	195.8	1309.4
1974	52.5	84.6	62.7	53.8	55.0	19.5	39.0	97.1	46.4	97.9	170.6	217.4	966.5
1975	105.8	95.3	67.9	49.6	170.9	48.6	25.2	46.3	20.4	172.7	219.7	196.0	1209.6
1976	176.4	176.4	49.3	14.5	19.5	32.7	55.8	243.0	96.4	155.9	99.7	193.9	1104.7
1977	75.3	47.6	117.9	99.2	22.0	22.6	74.3	72.9	84.9	59.6	91.1	153.3	920.7
1978	163.1	102.6	44.4	102.0	45.6	39.7	108.3	121.6	188.3	101.3	29.2	176.4	1200.5
1979	177.0	73.8	27.9	64.8	27.9	52.2	127.5	144.8	159.5	91.7	174.7	130.2	1249.8
1980	214.8	50.9	155.6	32.4	75.2	27.3	11.9	48.0	88.8	84.4	172.7	197.5	1170.5
Max	265.4	376.5	204.8	298.0	170.9	404.5	266.5	638.9	252.0	411.1	353.8	318.8	1970.0
Min	48.7	33.4	4.9	3.0	2.6	0.2	4.3	1.9	3.9	15.4	24.6	45.3	866.5
Ave	141.3	106.0	96.2	70.3	55.9	71.1	65.0	39.2	97.6	136.8	146.5	147.0	1223.5

Table A5-1-7(a) Daily Maximum Precipitation (mm) and Dates (Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1931	29	10	5	11	12	29	11	13	27	30	20	17	29. VII
	76.4	21.1	23.4	38.2	46.0	127.0	30.3	80.2	97.5	37.5	39.2	25.0	127.0
1932	11	14	9	22	13	12	26	8	15	19	3	19	12. VI
	22.0	53.5	26.5	60.3	11.4	110.4	42.9	49.3	10.2	19.2	66.4	24.7	110.4
1933	10	4	26	7	21	28	10	7	16	3.24	30	3	10. VII
	24.8	26.2	16.8	14.4	17.5	16.9	70.8	33.5	35.6	25.0	28.0	41.1	70.8
1934	8	15	6	3	31	14	5	18	10	11	25	7	11. X
	25.0	19.8	3.8	3.0	24.5	16.5	24.6	37.6	40.4	71.5	37.0	28.0	71.5
1935	19.6	8	4	2	4	30	1	19	28	29	5	4	28. IX
	23.2	34.2	13.4	9.7	19.1	28.6	23.8	6.4	79.2	63.9	22.5	24.8	79.2
1936	14	19	16	25	27	25	15	11	11	22	24	4	15. VII
	23.1	40.1	15.1	32.4	58.6	33.8	218.7	70.4	66.4	31.8	48.5	68.7	218.7
1937	13	25	4	7	6	1	14	6	30	17	14	1	17. X
	39.0	34.0	7.0	22.0	22.0	8.0	17.0	41.0	25.0	77.3	27.4	11.2	77.3
1938	6	5	29	18	5	17	6	26	18	10	7	10	18. IX
	29.7	17.3	28.9	30.1	20.9	18.0	20.1	9.2	71.3	10.1	66.0	20.3	71.3
1939	1	2	10	12	14	3	6	12	26	5	24	11	26. IX
	21.0	29.1	27.3	9.4	11.3	10.0	28.0	29.3	48.4	29.1	33.4	37.6	48.4
1940	4	24	8	9	21	7	2	19	18	24	2	29	19. VIII
	18.9	26.9	29.0	11.6	11.4	22.0	24.2	69.7	18.7	34.2	18.2	41.4	69.7
1941	29	28	14	11	16	21	4	24	5	14	20	27	14. X
	25.8	12.2	25.8	15.8	28.9	9.0	32.5	13.5	27.5	35.5	31.6	28.2	35.5
1942	24	28	7	1	21	26	18	31	13	20	15	6	15. XI
	19.9	14.0	21.7	14.4	25.5	18.6	10.6	51.2	47.3	34.1	75.5	19.3	75.5
1943	6	19	3	12	21	1	11	1	8	16	5	3	12. IV
	31.4	9.8	11.5	124.5	10.4	15.9	11.1	11.5	17.3	70.1	28.8	31.6	124.5
1944	14	18	28	3	2	17	27	26	21	18	18	23	18. XI
	34.8	14.0	33.2	21.2	13.8	34.9	46.2	16.2	9.9	24.3	48.6	25.6	48.6
1945	14	1	5	16	1	16	20	6	29	10	29	14	16. VI
	26.8	18.6	18.1	17.4	1.7	95.1	11.0	3.7	17.8	81.2	36.2	22.3	95.1
1946	1	15	13	13	30	19	11	27	16	12	13	14	15. II
	20.1	46.8	25.9	13.2	23.6	26.9	15.5	13.4	13.0	39.5	33.7	34.5	46.8
1947	25	18	11	13	19	20	30	30	26	21	7	28	21. X
	22.5	27.6	22.8	23.9	5.4	25.8	11.4	38.4	20.4	81.1	53.9	16.2	81.1
1948	3	13	18	28	30	28	20	24	19	3	26	5	3. X
	42.0	49.0	38.1	17.4	24.5	44.3	27.6	12.4	16.3	56.9	56.3	8.7	56.9
1949	23	2	11	11	20	28	12	21	8	31	11	15	12. VII
	27.3	32.4	19.0	32.7	8.3	19.3	39.9	22.8	38.8	5.1	12.8	33.0	39.9
1950	1	24	7	5	4	22	10	12	7	9	28	30	9. X
	34.9	21.2	27.9	17.2	11.8	27.8	37.8	32.0	13.8	54.0	49.3	13.9	54.0
1951	21	21	22	8	7	15	30	29	21	5	8	13	15. VI
	28.6	12.8	51.7	34.6	8.6	86.2	70.5	15.7	36.5	24.6	28.3	55.6	86.2
1952	16	11	3	10	18	26	27	28	29	20	12	9	20. X
	21.6	21.6	15.6	15.8	21.0	22.8	7.0	2.3	19.9	56.3	33.7	13.2	56.3
1953	11	3	2	20	17	30	15	25	8	7	17	18	25. VIII
	22.9	22.2	41.0	22.0	12.5	43.0	5.5	79.9	65.4	38.8	38.1	14.9	79.9
1954	19	19	23	14	16	11	1	20	25	2	22	5	11. VI
	34.1	22.4	7.7	31.3	19.4	147.1	27.5	29.6	2.5	37.6	40.9	22.1	147.1
1955	16	16	30	8	2	14	2	1	7	7	23	6	1. VIII
	39.1	29.2	19.3	22.9	12.5	12.3	44.6	431.5	16.6	94.7	42.7	62.5	431.5
1956	31	9	4	10	18	28	27	25	14	12	7	8	14. IX
	27.1	20.9	15.5	23.9	12.3	52.5	25.3	7.3	63.9	62.3	58.5	31.5	63.9
1957	20	13	2	20	27	3.8	26	23	28	27	14	1	1. XII
	15.4	16.8	16.5	5.0	22.2	0.1	5.2	27.5	29.0	29.6	29.1	74.2	74.2
1958	26	22	19	17	3	10	26	28	2	21	28	3	3. XII
	28.4	18.3	25.9	11.4	7.5	57.6	44.2	12.1	53.9	21.7	21.3	61.2	61.2

Table A5-1-7(b) Daily Maximum Precipitation (mm) and Dates (Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1959	27	4	10	13	6	7	5	9	2	7	12	17	2. IX
	45.8	21.4	13.1	23.7	13.5	16.0	16.6	43.1	59.2	10.8	34.5	16.8	59.2
1960	9	5	5	4	31	19	26	23	15	20	19	29	20. X
	37.0	22.6	19.2	14.5	24.6	60.8	23.3	60.2	21.5	127.4	52.4	30.6	127.4
1961	18	15	24	29	27	14	27	25	12	23	22	23	23. XI
	31.8	23.2	25.7	13.4	31.7	38.8	13.6	25.7	25.6	28.5	73.6	19.8	73.6
1962	4	12	9	2	25		21	2	23	6	5	25	21. VII
	53.8	29.8	34.2	25.4	5.7	48.3	62.7	2.6	54.2	21.6	19.7	38.0	62.7
1963	24	15	2	29	20	5	25	11	16	12	15	9	5. VI
	24.9	10.4	39.1	40.4	15.5	66.7	20.0	37.5	41.4	40.9	47.7	34.7	66.7
1964	24	2	2	29	14	10	2	13	11	2	20	8	11. IX
	21.5	24.6	37.5	22.0	21.6	23.7	59.5	49.6	106.6	6.6	55.7	42.4	106.6
1965	27	4	11	28	8	19	13	23	18	14	26	14	13. VII
	29.5	48.4	20.4	32.3	8.5	21.5	73.9	12.7	2.0	58.5	42.3	29.9	73.9
1966	8	5	12	1	1	4	4	11	11	15	27	27	11. VIII
	26.8	11.2	33.2	14.6	8.1	11.7	8.2	92.0	9.7	49.6	15.3	39.4	92.0
1967	16	25	16	20	30	3	5	20	20	8	24	20	16. I
	83.8	21.5	36.8	18.6	18.0	12.0	13.0	46.5	47.4	41.7	53.0	22.8	83.8
1968	28	28	13	17	20	15	20	11	29	4	22	27	4. X
	18.8	19.6	29.4	14.1	25.3	8.1	1.5	27.4	43.6	46.9	39.3	19.8	46.9
1969	13	19	22	27	14	23	3	22	22	9	8	18	14. V
	28.6	34.6	13.7	34.8	37.3	19.4	16.8	1.4	5.5	18.2	23.5	23.3	37.3
1970	30	13	18	17	27	2	28	27	30	25	18	25	28. VII
	28.4	33.7	23.5	18.2	29.4	27.0	128.8	93.9	37.1	32.4	33.8	12.2	128.8
1971	12	27	9	16	11	11	22	27	8	20	3	18	20. X
	19.8	19.4	24.6	13.7	16.7	14.0	42.4	16.7	64.8	65.6	22.3	43.0	65.6
1972	13	17	25	3	31	22	5	27	30	21	27	20	22. VI
	27.2	15.3	18.5	28.0	11.2	153.7	19.1	28.3	54.0	37.3	34.6	16.5	153.7
1973	31	22	1	27	27	27	26	8	21	12	3	6	3. XI
	15.8	13.8	22.5	23.8	20.6	71.1	16.5	18.2	4.0	39.0	72.5	48.5	72.5
1974	21	25	8	20	11	21	9	16	1	28	3	1	16. VIII
	15.0	20.4	12.8	16.6	13.9	9.0	19.2	78.6	21.8	42.8	52.3	39.6	78.6
1975	10	9	27	20	1	10	5	15	22	27	15	20	1. V
	38.8	26.4	20.6	21.0	85.1	21.7	20.2	24.7	-9.3	42.6	52.3	30.8	85.1
1976	5	9	27	17	5	9	27	23	3	25	25	14	23. VIII
	36.2	12.4	16.5	6.0	8.7	10.2	21.4	74.0	35.4	38.2	58.5	51.5	74.0
1977	3	28	2	12	30	13	13	18	26	16	11	4	4. XII
	16.3	21.7	26.0	24.1	6.2	8.7	32.8	25.7	31.9	19.0	23.4	37.3	37.3
1978	7	21	24	6	13	30	1	14	30	23	2	1	1. VII
	46.6	34.0	16.5	30.1	19.4	13.3	63.1	40.2	41.2	40.0	6.1	34.5	63.1
1979	31	2	26	20	13	1	6	31	17	26	2	14	31. VIII
	28.5	10.6	15.2	20.7	12.9	20.7	68.6	100.5	75.7	34.4	48.6	35.7	100.5
1980	28	29	2	24	13	4	24	20	17.30	5	21	10	10. XII
	37.5	13.2	40.0	7.0	24.9	11.8	4.7	20.5	25.3	23.2	45.2	48.7	48.7
1981	7	16	15	5	9	15	3	26	11	31	13	16	26. VIII
	37.8	35.2	25.5	10.1	13.5	21.2	23.9	45.4	32.8	147.9	26.4	37.2	45.4
1982	8	4	18	1	18	10	9	28	4	18	7	31	31. XII
	31.8	11.2	35.9	31.3	10.1	9.8	37.0	103.4	8.1	36.2	29.3	45.5	45.5
1983	3	5	13	17	31	17	22	15	25	14	20	13	14. X
	43.7	9.7	10.7	14.9	5.7	7.4	113.4	56.9	17.6	48.5	22.4	18.4	48.5
1984	12	12	10	16	14	22	30	22	27	17	12	13	30. VII
	29.9	13.5	13.1	29.3	10.9	46.1	89.5	40.0	5.1	38.2	45.3	12.0	89.5
1985	30	19	21	2	30	19	4	22	6	13	8	16	13. X
	25.8	22.6	5.7	12.8	16.3	17.9	21.7	10.8	9.9	78.1	13.8	24.7	78.1
Maximum	83.8	53.5	51.7	124.5	85.1	153.7	218.7	431.5	106.6	127.4	75.5	74.2	431.5

Table A5-1-8(a) Highest Snow Thickness (cm, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1936		14										2	14
1937	27											17	27
1938		15											15
1939													
1940	14		4										14
1941	8		3										13
1942	40		8										40
1943	29		2										29
1944	32		2										32
1945	3		4										7
1946	3												
1947	41											10	22
1948		29	15										41
1949	9		20										29
1950	31		3										30
1951	5												38
1952			10										43
1953		4	10										10
1954	33												5
1955		22											33
1956	30		4										36
1957			1	4									1
1958	3												4
1959		6											6
1960	7		4										96

Table A5-1-8(b) Highest Snow Thickness (cm, Zonguldak)

YEAR	M O N T H												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1961	105	10	2									4	105
1962		6											6
1963	30	2	10									4	30
1964	53	22											53
1965	3	30										1	30
1966	16												16
1967	83	12	3								1	2	83
1968	16	1	7										16
1969	43	3											43
1970													
1971		11	4										11
1972	9	11	2										11
1973	23		9							8		5	23
1974	19									5		4	19
1975		17										17	17
1976	52	29	6									4	52
1977			9									4	9
1978	3												3
1979	7	5										3	7
1980	21	19	49										49
1981	3	13								5			13
1982	35	9	20									3	35
1983	67	20	3										67
1984		8										3	8
1985	6	91	61										91
Maximum	105	96	49							25		43	105

Table A5-1-9(a) Average Relative Humidity (Zonguldak, %)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1937	81	80	62	78	85	73	79	78	78	83	85	78	78
1938	77	76	74	87	86	82	89	87	89	91	92	93	85
1939	87	92	84	86	83	90	90	92	89	89	92	88	89
1940	88	90	78	90	91	92	81	81	77	80	78	77	84
1941	71	65	71	74	73	77	79	78	79	70	78	71	74
1942	74	81	80	79	75	70	76	82	81	82	81	80	78
1943	76	74	73	74	76	80	72	75	76	86	78	77	76
1944	76	65	72	78	78	77	74	74	76	76	73	80	75
1945	75	81	74	74	68	77	74	65	78	80	80	76	75
1946	79	76	86	86	89	85	76	76	78	76	79	77	80
1947	80	70	62	68	76	73	71	71	74	76	71	62	70
1948	64	79	73	76	80	78	72	75	73	76	73	74	74
1949	75	76	72	73	75	69	77	73	80	80	67	73	74
1950	77	64	76	72	80	70	71	71	75	75	72	64	72
1951	76	74	75	76	77	79	74	77	75	78	79	76	76
1952	71	75	70	79	81	78	81	74	76	71	70	68	75
1953	69	66	70	71	82	82	76	75	73	83	78	75	75
1954	78	83	81	82	76	80	81	78	76	81	76	78	79
1955	73	63	77	79	76	75	77	79	76	77	79	71	75
1956	73	75	75	63	73	72	69	70	68	69	68	67	72
1957	68	67	70	75	83	74	73	73	71	74	72	69	72
1958	68	55	34	69	66	68	71	70	75	72	73	67	69
1959	67	75	76	70	81	78	76	75	76	72	72	70	74
1960	73	68	78	85	77	80	80	77	81	62	74	59	75

Table A5-1-9(b) Average Relative Humidity (Zonguldak, %)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1961	70	81	67	71	71	79	77	80	71	77	66	72	74
1962	78	78	68	79	71	78	79	81	74	79	75	78	76
1963	79	72	69	83	82	72	78	70	77	79	69	70	75
1964	70	81	80	66	80	83	79	77	73	65	77	74	76
1965	71	73	81	74	72	72	75	76	74	75	63	63	73
1966	72	63	70	68	65	69	71	77	73	72	70	67	70
1967	69	70	74	68	74	73	72	73	71	79	73	66	72
1968	68	67	69	71	79	74	69	75	73	76	76	72	72
1969	78	66	76	70	72	65	74	69	69	72	58	64	69
1971	66	69	66	75	75	68	73	72	74	70	64	80	71
1972	68	70	70	66	73	73	78	71	70	72	63	67	70
1973	70	62	71	68	70	71	70	72	73	68	65	61	68
1974	69	67	80	66	65	66	62	70	64	62	64	63	66
1975	61	61	55	62	73	66	66	70	66	68	61	60	64
1976	51	60	70	60	71	65	62	70	64	75	65	57	64
1977	61	47	64	65	68	66	64	60	67	65	66	59	62
1978	61	60	64	58	57	58	64	69	62	66	60	57	61
1979	50	59	52	50	74	62	63	67	67	70	54	56	60
1980	60	65	60	60	54	58	62	59	61	52	54	50	58
1981	55	57	60	62	76	73	76	67	77	76	69	64	68
1982	73	71	71	69	82	63	67	72	69	66	61	60	69
1983	67	61	63	65	68	68	69	67	69	70	68	64	66
1984	62	73	63	75	59	63	70	67	63	65	68	65	66
1985	64	66	72	64	65	67	64	69	65	68	64	64	66
average	71	70	72	72	75	74	74	74	74	74	71	70	73

Table A5-1-10 Monthly Evaporation (Zonguldak, mm)

Year	month												ANNUAL
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1964	58.8	41.0	50.0	117.0	62.1	53.6	70.8	83.6	84.0	129.0	59.6	115.4	926.9
1965	69.5	52.4	53.3	95.1	113.4	129.9	105.8	89.7	93.5	81.1	159.8	114.5	1156.0
1966	78.7	98.0	87.1	112.4	121.9	117.2	137.9	109.3	107.0	106.3	107.7	92.0	1275.5
1967	-	-	64.8	118.9	94.4	91.5	163.4	135.0	115.5	65.9	82.7	-	912.1
1968	-	-	62.8	75.1	81.3	114.0	151.2	117.2	119.1	71.4	74.9	76.8	943.8
1969	-	-	56.3	91.0	110.0	179.5	115.2	128.6	124.9	92.5	132.2	107.9	1138.1
1970	77.7	105.3	122.2	116.5	143.9	121.6	120.0	169.7	119.8	125.4	140.8	-	1392.9
1971	-	-	-	89.4	118.5	138.3	90.8	95.4	94.6	111.3	163.9	116.7	1018.9
1972	-	-	95.1	149.2	102.0	86.9	92.0	115.6	119.7	87.3	127.3	72.2	1077.3
1973	-	-	-	111.8	106.4	103.4	141.7	99.4	73.7	118.7	98.6	122.4	1045.3
1974	-	-	34.1	78.0	128.0	104.0	114.7	82.2	107.3	156.1	87.7	-	892.1
1975	-	-	-	136.4	633.3	92.5	121.0	109.5	101.5	100.7	100.3	-	829.5
1976	-	-	18.0	112.1	65.9	95.7	124.3	92.3	97.6	58.7	79.2	-	746.3
1977	-	-	-	82.5	77.0	103.2	133.4	153.5	82.6	74.5	142.9	-	852.6
1978	-	-	-	86.1	126.3	128.0	105.0	81.8	106.4	68.6	85.6	100.7	888.4
1979	-	-	52.1	63.9	56.8	78.1	84.7	84.7	63.9	54.0	50.9	82.8	671.9
1980	-	-	-	115.5	125.1	125.1	92.4	92.5	83.5	109.0	111.3	120.5	722.5
1981	-	-	-	86.3	78.0	111.5	76.9	106.8	77.1	88.3	44.0	-	668.9
1982	-	-	-	74.5	42.9	109.5	91.9	81.9	93.4	94.9	112.6	-	706.6
1983	-	-	-	97.3	107.0	101.7	115.8	126.3	100.3	78.4	77.4	-	804.2
1984	-	-	-	45.0	156.7	107.6	111.8	104.4	122.7	117.2	28.3	-	788.2
1985	-	-	-	135.4	120.4	130.8	137.0	109.7	113.8	90.3	118.8	-	956.2
average	71.2	74.2	63.8	114.2	99.2	109.2	114.2	108.2	99.8	94.7	106.2	102.0	1147.5

Table A5-1-11(a) Maximum Wind (Zonguldak, m/sec)

Year	month												annual
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1937	-	-	SW 11.1	-	-	NE 5.0	W 9.4	N 7.5	N 11.1	N 20.8	NW 12.0	NW 24.9	NW 24.9
1938	-	-	-	NW 9.8	NW 5.2	NW 8.2	S 6.4	NE 9.6	NW 28.4	NW 14.0	NW 13.4	SEN 6.6	NW 28.4
1939	N 36.4	NE 14.0	NW 16.5	NW 11.8	E 9.3	NW 9.4	NW 3.9	NW 6.4	NW 8.1	NW 8.2	NW 3.8	NE,NW 15.3	NW 36.4
1940	NW 15.4	S,SE 14.1	NE 15.3	NW 5.2	N 3.9	NW 3.6	NW 6.0	NE 5.6	NE 4.0	NW 11.8	N 5.7	NW 12.6	NW 15.4
1941	N 6.2	SE 6.8	N 5.7	N 8.1	NW 7.2	NW 4.0	NW 5.6	NW 21.8	NW 16.5	NW 12.4	NW 16.5	NW 16.5	NW 21.8
1942	NW 18.0	SE 5.4	NW 12.0	SE 7.5	SE 10.6	N,NW 5.7	NW 6.0	NW 11.1	SE 11.2	NW 7.6	NW 11.0	NW 12.4	NW 18.0
1943	NW 12.4	SE 14.6	NW 13.6	SE 6.9	SE 6.0	NW 6.4	NE 10.6	NW 7.4	SE 7.5	NW 6.2	NW 9.2	NW 8.4	NW 14.6
1944	NW 8.1	NW 10.2	SW 9.9	NW 8.2	NW 7.0	N 6.2	NE 6.6	NE 7.2	NE 5.7	NE 5.1	NW 15.9	NW 10.2	NW 15.9
1945	NW 18.4	SW 15.6	NW 15.8	SE 6.3	NW 5.8	NW 6.8	NE 6.0	NE 10.4	SE 10.2	NW 17.0	NW 15.4	NW 16.6	NW 18.4
1946	SE 16.5	SE 16.8	NW 10.2	SE 15.3	NE 8.6	NE 7.4	NE 8.1	NW 12.4	NW 6.6	NW 15.8	NW 6.6	NW 19.5	NW 19.5
1947	SE 15.4	N 10.2	NNW 10.2	NW 10.8	SE 10.0	NW 10.2	NW 11.0	NW 6.9	NW 7.4	NNW 8.6	N 7.6	NNW 21.8	NW 21.8
1948	SE 15.2	NW 10.8	NNW 12.0	NW 15.6	NW 14.1	NW 8.6	W 5.8	NNW 8.6	NNW 8.7	NNW 9.6	S 16.4	S 11.0	S 18.6
1949	W 6.2	NNW 13.2	S 8.1	SE,NW 7.5	NNE 6.2	NW 5.7	NW 8.7	N 6.9	NE 7.1	SE 8.4	SSE 15.0	SSE 11.6	NW 15.0
1950	S 8.6	S 12.5	NW 7.4	W 4.5	S 7.7	S 3.0	NW 5.3	NNW 8.1	NE 6.0	NE 11.4	NW 8.0	NE 10.7	S 12.5
1951	SE 11.3	N 11.3	NE 10.8	SSW 7.7	NW 10.5	NW 11.0	NNE 7.8	NNW 7.5	NE 7.8	NW 8.4	NW 7.7	SE 8.4	NW 11.3
1952	S 11.1	S 9.3	N 6.6	SE 7.2	S 7.1	N 9.2	W 7.5	W 6.2	NNE 7.1	NW 8.9	NW 16.8	N 8.3	S 16.8
1953	W 10.2	NW 10.2	NNW 9.2	W 7.7	N 13.8	SE 4.4	NNW 5.4	NE 6.4	SSE 6.8	NW 6.0	NW 12.5	SE 10.1	SE 13.8
1954	SE 8.4	SE 8.7	SE 8.3	NW 8.1	NNW 7.8	NW 13.1	NW 10.7	SSE 10.4	NNW 8.4	NW 11.4	SE 9.8	SE 10.1	SE 13.1
1955	WNN 12.0	SSE 18.0	WSW 11.0	SSE 8.7	WSW 8.4	NNW 8.7	NW 9.0	NW 7.2	NW 7.1	NW 9.0	NW 14.4	SE 18.8	SE 18.8
1956	S 27.7	NE 25.8	SE 13.8	SSE 22.2	NNW 13.5	NNE 6.4	NW 6.0	NNW 8.7	NW 7.8	NW 18.8	NW 17.0	NW 15.2	NW 27.7
1957	N 11.6	SSE 21.5	NNW 12.1	WSW 15.6	NW 16.1	N 5.8	NW 7.2	W 13.0	SSW 11.6	S 8.0	NW 6.7	SSE 13.4	NW 21.5
1958	S 14.3	NW 19.3	NNW 25.0	SSE 17.4	SE 4.9	SSE 18.8	NNW 14.3	W 14.3	NW 6.7	NNW 15.6	SSE 7.6	WSW 11.6	SSE 25.0
1959	SSE 19.2	WSW 19.2	NNW 7.2	SE 13.0	WSW 13.4	W 6.7	W 7.2	S 5.8	ENE 15.6	W 12.5	W 20.6	SSE 14.5	SSE 20.6
1960	NW 21.5	SSE 14.8	SSE 15.2	SSE 13.4	SE 17.9	W 11.2	NW 6.3	N 8.5	N 9.4	S 12.1	SSW 12.1	NNW 22.4	SSE 22.4
1961	NNW 13.8	S 11.6	S 13.9	NNW 11.6	W 13.4	NNW 6.0	NNW 5.8	NNE 8.9	N 12.5	SSE 11.6	S 13.4	SSW 10.7	SSW 13.9
1962	WSW 9.4	SSE 22.4	SSE 20.5	W 17.0	W 25.0	N 23.3	NNE 16.0	SW 13.0	ESE 16.0	ESE 17.3	NW 18.4	S 29.2	WSW 29.2
1963	W 24.4	SSW 22.5	NE 20.6	WSW 13.0	W 22.1	W 15.8	NE 12.8	WNN 13.7	W 18.8	SSE 13.0	NNW 17.0	SSE 22.4	NNW 24.4
1964	SSE 25.0	N 23.6	NNE 13.4	SSW 23.2	SSE 21.2	WSW 12.0	W 16.5	NNE 21.7	N 21.1	NNE 17.0	W 25.6	SSE 19.1	SSE 28.6
1965	W 20.8	SSE 19.8	NNW 13.7	W 20.2	W 15.1	SSE 15.6	NNW 16.6	N 16.3	N 12.0	S 15.0	SE 20.0	SE 22.3	W 22.3
1966	S 25.0	W 14.0	N 20.1	WSW 19.6	WSW 15.1	WSW 15.6	N 12.6	NW 16.5	N 14.9	S 14.2	NNW 20.4	NNE 21.4	NNW 25.0
1967	S 19.7	SSE 21.5	N 16.0	NNE 18.2	NNE 17.0	NNE 10.8	NNE 18.2	NNW 12.0	N 20.0	SSE 15.7	NE,NNE 23.0	SSE 15.4	SSE 23.0
1968	NHE 25.4	WSW 31.8	W 20.6	W 16.6	W 16.7	SSE 20.4	W 12.2	W 26.6	NNE 17.4	N 24.6	SSE 18.0	SSE 21.4	SSE 31.5
1969	W 20.0	W 24.0	SSE 19.2	SSE 19.1	W 11.1	WSW 28.2	NNW 15.3	NNW 13.6	N 13.7	W 17.5	W 19.6	NNW 24.6	W 21.2
1970	W 20.1	W 26.6	SSE 22.3	SSE 27.4	W 27.8	WSW 13.7	NNW 16.9	NNW 18.6	N 13.6	W 22.7	W 30.2	NNW 24.0	W 30.2

Table A5-1-11(b) Maximum Wind (Zonguldak, m/sec)

Year	month												annual
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
1971	SSE 23.9	W 24.1	W 29.1	WSW 14.6	W 12.5	W 15.4	W 15.0	NNE 14.0	NW 17.4	NNW 23.2	SSE 21.9	W 22.8	W 29.1
1972	NW 17.0	SSE 16.0	NNW 21.2	SSE 19.8	WNW 17.2	WNW 21.4	W 14.0	W 21.6	N 15.8	SSW 22.9	WNW 16.2	WNW 14.0	SSW 22.9
1973	SE 18.0	WSW 18.5	W 28.7	WNW 16.0	WNW 15.2	S 13.8	SE 23.0	WSW 12.3	N 13.2	WSW 19.9	SSE 20.9	SSE 25.0	W 28.7
1974	NNW 20.1	WSW 22.0	WSW 19.5	WSW 22.0	W 27.4	WSW 16.5	WNW 18.0	WNW 19.2	W 27.3	N 18.8	W 19.2	W 19.2	W 27.4
1975	N 25.1	N 18.0	WSW 19.2	S 16.9	SW 9.8	SW 12.8	SE 14.4	N 16.5	NW 15.6	WSW 15.8	SSE 32.0	NNW 19.2	SSE 32.0
1976	WSW 24.7	NNW 22.0	SW 17.8	WSW 16.7	N 4.5	WSW 10.8	N 6.8	WSW 12.3	SSW 16.0	N 16.3	NNW 17.7	SE 23.4	WSW 24.7
1977	N 18.8	SSW 14.2	N 26.0	WSW 22.0	SW 15.2	ENE 14.0	WSW 14.5	NE 25.5	W 18.1	N 15.6	WSW 21.7	NNW 18.7	N 26.0
1978	N 18.8	NNW 15.2	WSW 16.1	W 15.0	SE 20.2	N 15.9	WSW 16.7	WSW 6.0	W 25.0	NNW 17.0	W 22.6	S 21.2	W 25.0
1979	SW 18.7	S 23.2	SSE 15.0	SSW 20.0	NNW 4.7	MNE 13.0	WNW 11.7	WNW 31.5	NNW 16.4	MNE 19.3	SE 19.9	NNW 18.9	WNW 31.5
1980	SE 23.3	S 11.9	S 14.0	WSW 16.3	WSW 14.0	WSW 13.5	WSW 4.7	WSW 14.0	NNE 14.7	WNW 19.8	WNW 17.9	NNW 21.5	SE 23.3
1981	SE 19.9	NNW 17.5	WSW 75.6	WSW 15.8	WSW 18.3	NNW 9.6	WSW 13.1	WSW 15.1	NNE 15.1	W 23.5	ESE 19.9	SW 26.1	SW 26.1
1982	W 16.3	NNW 16.3	SSW 21.9	SSW 17.6	WSW 19.6	WNW 17.0	NNW 16.0	W 17.0	N 12.4	W 15.1	SE 18.9	N 16.8	SSW 24.9
1983	NW 19.8	WSW 19.8	WSW 23.5	S 16.6	N 15.0	NSW 16.5	WSW 23.8	NNS 18.6	NNW 21.5	WNW 18.3	SE 21.1	NE 13.5	WSW 23.8
1984	ESE 23.7	NNW 13.7	SSW 29.5	W 11.5	WSW 21.9	WSW 17.1	E 16.5	WSW 16.6	WSW 18.6	NNE 18.5	WSW 19.9	W 15.9	SSW 29.5
1985	S 22.1	WSW 25.1	N 20.0	SW 31.5	WSW 19.1	SW 27.1	WNW 21.4	NNW 26.9	NNW 20.3	WNW 15.9	W 18.8	W 24.2	SW 31.5
maximum	36.4	31.8	29.1	23.2	27.8	28.2	23.0	31.5	28.4	24.6	32.0	29.2	36.4

Table A5-1-12(a) Number of Stormy Days (Zonguldak, over 17.2m/s)

Year	month												annual	
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII		
1937	2								1	2			2	6
1938	1	1												3
1938	1		1											2
1940	1		1	1										3
1941								1	1		2	3		7
1942	2													2
1943														
1944											1			1
1945	3	3	2							1	1	1		11
1946	2	2		1						2				8
1947	2	1											2	5
1948	1			1							2			4
1949														
1950														
1951														
1952														
1953														
1954										1				1
1955		1											1	2
1956		2		1										5
1957	1	1								1				1
1958		1	2	1										5
1959	2	1				1								4
1960	2			1									2	5

Table A5-1-13(a) Evaporation Rate

Months	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Potential Evaporation (mm)	8.0	15.0	25.0	40.0	65.0	95.0	125.0	94.0	55.0	20.0	5.0	2.0	549

Table A5-1-13(b) Blaney-Criddle Water Demand of Plants

Plants	Rate of Plantation %	Month												ANNUAL
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
Wheat	20	23.21	26.73	38.94	75.77	170.06	146.45	31.17	-	-	30.61	26.57	569.51	
Tree	12	-	-	14.60	55.60	106.72	145.44	177.60	151.23	94.76	20.93	10.12	825.43	
Corn	26	-	-	-	13.47	76.15	136.99	169.70	65.19	-	-	-	461.49	
Beans	10	-	-	-	-	69.50	11.73	158.33	56.02	-	-	-	397.57	
Sun Flower	4	-	-	-	19.00	58.05	97.34	159.73	142.35	3.52	-	-	479.99	
Potatoes	7	-	-	-	10.64	65.53	135.04	114.09	73.02	-	-	-	448.32	
Melon	3	-	-	-	10.44	50.11	86.43	94.92	33.03	-	-	-	274.94	
Vegetable	10	-	-	-	-	54.97	110.68	147.30	112.57	18.14	-	-	443.64	
Yonca	8	-	-	22.09	71.27	122.05	154.86	1184.11	172.35	125.76	81.75	23.19	1003.05	
Misir-2 UR	10	-	-	-	-	-	-	-	92.30	89.50	2.04	-	183.84	
Sebze-2 UR	5	21.52	04.9	-	-	-	-	-	-	39.94	39.23	22.24	101.41	

Table A5-1-14 Potential Evaporation Values Weighted Average

Plants	Rate of Plantation ⁸	Growth Period	Month												ANNUAL	
			JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC		
Wheat	20	1.11/ 15.7 16./	4.64	5.34	7.79	15.15	34.00	29.29	12.90P	6.23	9.40P	5.50P	4.00P	6.12	5.31	134.13
Tree	12	29.12 20.4/	0.96P	1.80P	1.45P	6.67	12.80	17.45	21.31	18.15 16.95	11.37	14.30P	5.81	2.51	0.23P	100.51
Corn	26	15.8 1.5/	2.08P	6.50P	6.50P	6.59P	19.80	35.62	44.12	4.85P 5.60	5.50P	5.20P	0.52P	4.30P	0.52P	150.38
Beans	10	5.8 15.4/	0.80P	1.59P	2.50P	4.00P	6.95	11.38	15.83	4.85P 5.11	5.50P	2.00P	0.20P	0.50P	0.20P	56.10
Sun- flower	4	15.4 15.4/	0.32P	0.60P	1.00P	0.76	2.30	3.89	6.39	5.69	0.14	0.80	0.08P	0.20P	0.08P	22.17
Potatoes	7	15.8 20.4/	0.16P	1.05P	1.75P	1.31P	4.59	9.45	11.49	3.40P 0.99	3.85P	0.40P	0.04P	0.10P	0.04P	37.59
Melon	3	15.8 1.5/	0.24P	0.45P	0.75P	0.76P	1.50	2.59	2.84	1.46P 1.81	1.65P	0.80P	0.08P	0.15P	0.08P	13.25
Vegetable	10	10.9 16.3/	0.80P	1.50P	2.50P	4.00P	5.50	11.07	14.73	11.26	3.85P	2.00P	0.20P	0.50P	0.20P	57.91
Yonca	8	29.12	0.64P	1.20P	0.97P	5.70	9.76	12.39	14.73	13.79	10.06	6.54	1.85	3.65	1.85	81.28
Second crop			-	-	-	-	-	-	-	-	9.23	8.95	-	-	-	-
Corn	10	1.9/1.10														
Second crop																
Vegetable	5	1.10/1.2	1.07	-	-	-	-	-	-	-	-	2.00	1.11	1.96	1.11	-
Total for Blaney method			5.71	5.34	11.31	32.83	97.20	133.13	137.67	86.77	32.33	14.35	14.24	9.48	580.36	
Total for Penman method			6.00P	12.00P	17.42	17.41P	-	-	12.90	31.72P	34.65	15.2P	2.75P	1.33P		
Grand Total			11.71	17.34	28.73	50.24	97.20	133.13	150.57	118.49	66.98	29.55	16.99	10.81	731.74	

Penman Methods Indicated with "P"

Table A5-1-15 Filyos River

Values in mm	Month												ANNUAL
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1 Actual Monthly	11.71	17.34	28.73	50.24	97.20	133.13	150.57	118.49	66.98	29.55	16.99	10.81	731.71
Evaporation Daily	0.38	0.62	0.93	1.67	3.14	4.44	4.86	3.82	2.23	0.95	0.57	0.35	
2 Precipitation	108.80	78.20	72.50	51.50	48.00	48.30	53.70	62.70	58.50	74.10	98.10	101.10	855.5
3 Effective Precipitation	98.22	69.18	64.90	47.26	44.32	44.57	49.11	56.67	53.14	66.24	82.71	84.53	750.85
4 Run Off	20.58	9.02	7.60	4.24	3.68	3.73	4.59	6.03	5.36	7.86	15.59	16.57	104.85
5 Precipitation Monthly	-	-	-	2.98	52.88	88.56	101.46	61.82	13.84	-	-	-	
Deficit Daily				0.10	1.69	2.95	3.27	1.99	0.46				
6 Effective Earth Moisture and Variations	103	103	103	100.02	47.14	61.58	63.12	1.30	98.46	103	103	103	
7 Irrigation Dates						17	20		4				
8 Water Percolation	2.47	1.85	1.17	-	-	-	-	-	-	0.78	2.19	2.38	
9 Need for Irrigation						103	103	-	103				

Table A5-1-16 Water Quality

Hole No.	River	Water Class	R.S.C	pH	Conductivity at 25°C	Na	K	Ca+Mg	CO3	HCO3	CL	SO4	Na%	S.A.R
SN1	Filyos Cayl	C2S1	0	8.2	513	1.03	0.14	4.60	0.40	3.50	0.36	1.51	17.82	0.67
SN2	"	C2S1	0	8.2	419	1.03	0.15	4.40	0.50	3.25	0.36	1.47	18.41	0.69
SN3	"	C2S1	0	8.0	659	1.26	0.03	5.80	0.10	5.40	0.72	0.87	17.71	0.77
1	Tahansuyu	C2S1	0	7.9	586	1.06	0.02	5.40	0	3.40	0.84	2.24	16.31	0.64
9	"	C2S1	0	7.8	659	0.73	0.02	6.30	0	5.05	0.64	1.36	10.31	0.41
28	"	C3S1	0	7.3	952	1.24	0.05	9.90	0	8.40	1.12	1.67	11.08	0.55
42	"	C3S1	0	7.3	753	0.82	0.05	7.60	0	7.00	0.34	1.13	9.68	0.42

FLYOS Feb 1990
All directions
Table 5-3-1(a) Wave Occurrence

period(s) height (m)	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.19	11	24	8	1	1													45 (155)
.20-.39		19	37	9														65 (223)
.40-.59	1	9	24	12	1													47 (162)
.60-.79		4	14	20	4													42 (144)
.80-.99			7	20	12													39 (134)
1.00-1.19			8	15	11													34 (117)
1.20-1.39				4	8	1												13 (43)
1.40-1.59					1	1												2 (7)
1.60-1.79				1	1	2												4 (14)
1.80-1.99																		0 (0)
2.00-2.19																		0 (0)
2.20-2.39																		0 (0)
2.40-2.59																		0 (0)
2.60-2.79																		0 (0)
2.80-2.99																		0 (0)
3.00-3.19																		0 (0)
3.20-3.39																		0 (0)
3.40-3.59																		0 (0)
3.60-3.79																		0 (0)
3.80-3.99																		0 (0)
4.00-4.19																		0 (0)
4.20-4.39																		0 (0)
4.40-4.59																		0 (0)
4.60-4.79																		0 (0)
4.80-																		0 (0)
total	0	12	56	98	82	38	5	0	0	0	0	0	0	0	0	0	0	291 (1000)
(0.1%)	(0)	(41)	(192)	(337)	(282)	(131)	(17)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	calm recordless 45(13+)

Table 5-3-1(b) Wave Occurrence

FILLIOS Mar 1990		All directions													Total					
period(s)	height(m)	0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	Total	
		0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	(0.1%)	
.20- .39	.19	3	12	69	37	1													122	
			8	33	36	2														(328)
.40- .59				16	23	9	1													(212)
.60- .79				2	16	16	2													(132)
.80- .99				1	7	14	4													(97)
1.00- 1.19					3	6	10													(70)
1.20- 1.39						1	10													(51)
1.40- 1.59					1	3	8	1												(30)
1.60- 1.79						4	3	1												(13)
1.80- 1.99							3	1												(35)
2.00- 2.19								1												(22)
2.20- 2.39									1											(11)
2.40- 2.59										1										(5)
2.60- 2.79											1									(3)
2.80- 2.99												1								(3)
3.00- 3.19													1							(3)
3.20- 3.39														0						(0)
3.40- 3.59															0					(0)
3.60- 3.79																0				(0)
3.80- 3.99																	0			(0)
4.00- 4.19																		0		(0)
4.20- 4.39																				(0)
4.40- 4.59																				(0)
4.60- 4.79																				(0)
4.80-																				(0)
Total	(0.1%)	0	3	20	121	123	56	42	7	0	0	0	0	0	0	0	0	0	0	372
		(0)	(8)	(54)	(331)	(331)	(151)	(113)	(19)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																				calculated
																				records
																				(0)
																				(0)

Table 5-3-1(c) Wave Occurrence

FILOYOS Apr 1980
All directions

period(s) height(m)	0.5 - 1.0	1.0 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	Total (0.1%)
.20- .39			12	60	36	3													114 (317)
.40- .59			2	35	23	14													74 (308)
.60- .79				2	7	11	2												22 (206)
.80- .99					4	10	4												18 (61)
1.00- 1.19						5	10	1											16 (50)
1.20- 1.39						1	4												5 (44)
1.40- 1.59																			0 (14)
1.60- 1.79																			0 (0)
1.80- 1.99																			0 (0)
2.00- 2.19																			0 (0)
2.20- 2.39																			0 (0)
2.40- 2.59																			0 (0)
2.60- 2.79																			0 (0)
2.80- 2.99																			0 (0)
3.00- 3.19																			0 (0)
3.20- 3.39																			0 (0)
3.40- 3.59																			0 (0)
3.60- 3.79																			0 (0)
3.80- 3.99																			0 (0)
4.00- 4.19																			0 (0)
4.20- 4.39																			0 (0)
4.40- 4.59																			0 (0)
4.60- 4.79																			0 (0)
4.80-																			0 (0)
Total (0.1%)	0 (0)	0 (0)	39 (108)	159 (442)	97 (269)	44 (122)	20 (56)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	360 (1000)
																			records (0)
																			records (0)

Table 5-3-1(d) Wave Occurrence

FILYOS May 1990

All directions

period(s)	0.9 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 11.0	11.0 - 12.0	12.0 - 13.0	13.0 - 14.0	14.0 - 15.0	15.0 - 16.0	16.0 - 17.0	Total
height(m)	0.9 - 1.9	1.9 - 2.9	2.9 - 3.9	3.9 - 4.9	4.9 - 5.9	5.9 - 6.9	6.9 - 7.9	7.9 - 8.9	8.9 - 9.9	9.9 - 10.9	10.9 - 11.9	11.9 - 12.9	12.9 - 13.9	13.9 - 14.9	14.9 - 15.9	15.9 - 16.9	16.9 - 17.9	(0.1%)
.19	1	28	50	8														87
.20- .39		8	39	28														(234)
.40- .59		1	17	35	5													(75)
.60- .79			4	23	24													(202)
.80- .99			2	16	25	5												(156)
1.00- 1.19				8	13	9												(151)
1.20- 1.39				3	2	3	4											(129)
1.40- 1.59						4	2											(81)
1.60- 1.79					1	2	1											(12)
1.80- 1.99							1											(32)
2.00- 2.19																		(6)
2.20- 2.39																		(16)
2.40- 2.59																		(4)
2.60- 2.79																		(11)
2.80- 2.99																		(1)
3.00- 3.19																		(3)
3.20- 3.39																		(0)
3.40- 3.59																		(0)
3.60- 3.79																		(0)
3.80- 3.99																		(0)
4.00- 4.19																		(0)
4.20- 4.39																		(0)
4.40- 4.59																		(0)
4.60- 4.79																		(0)
4.80- 4.99																		(0)
Total	0	1	37	112	121	70	24	7	0	0	0	0	0	0	0	0	0	372
(0.1%)	(0)	(3)	(100)	(301)	(325)	(188)	(65)	(19)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																		calm
																		recordless
																		(0)
																		(0)

Table 5-3-1(e) Wave Occurrence

FILYOS Jun 1990
All directions

period(s) height(m)	0-0.9	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.20-.39	4	41	104	11	1														151 (.447)
.40-.59		9	43	35															87 (.242)
.60-.79		1	21	11	3														36 (.100)
.80-.99			4	7	7														18 (.050)
1.00-1.19			2	1	11	3													17 (.047)
1.20-1.39					2	4	6												12 (.033)
1.40-1.59						1	11												12 (.033)
1.60-1.79						1	2												3 (.008)
1.80-1.99							2	2											4 (.011)
2.00-2.19									1	1									2 (.006)
2.20-2.39										1									1 (.003)
2.40-2.59										1									1 (.003)
2.60-2.79										4									4 (.011)
2.80-2.99										1									1 (.003)
3.00-3.19										1									1 (.003)
3.20-3.39																			0 (.000)
3.40-3.59																			0 (.000)
3.60-3.79																			0 (.000)
3.80-3.99																			0 (.000)
4.00-4.19																			0 (.000)
4.20-4.39																			0 (.000)
4.40-4.59																			0 (.000)
4.60-4.79																			0 (.000)
4.80-																			0 (.000)
Total (0.1%)	0 (.000)	4 (.011)	51 (.142)	174 (.483)	67 (.186)	28 (.078)	24 (.067)	3 (.008)	9 (.025)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	0 (.000)	360 (.1000)
																			calm recordless
																			0 (.000)

Table 5-3-1(f) Wave Occurrence

FILYOS Jul 1990
All directions

period(s) height(m)	0-0.9	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.20-.39			8	11															19 (.51)
.40-.59			2	43	47														92 (.248)
.60-.79			1	23	68	10													102 (.275)
.80-.99				5	37	23													65 (.175)
1.00-1.19				1	13	34	1												49 (.132)
1.20-1.39					4	15	9												28 (.76)
1.40-1.59					1	3	5												9 (.24)
1.60-1.79						1	2												3 (.8)
1.80-1.99						1	1												2 (.5)
2.00-2.19							2												2 (.5)
2.20-2.39																			0 (.0)
2.40-2.59																			0 (.0)
2.60-2.79																			0 (.0)
2.80-2.99																			0 (.0)
3.00-3.19																			0 (.0)
3.20-3.39																			0 (.0)
3.40-3.59																			0 (.0)
3.60-3.79																			0 (.0)
3.80-3.99																			0 (.0)
4.00-4.19																			0 (.0)
4.20-4.39																			0 (.0)
4.40-4.59																			0 (.0)
4.60-4.79																			0 (.0)
4.80-																			0 (.0)
Total (0.1%)	0 (.0)	0 (.0)	11 (.30)	83 (.224)	170 (.458)	235 (.615)	20 (.054)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	0 (.0)	371 (.999)

calm
records
0
(.0)

Table 5-3-1(g) Wave Occurrence

PILYOS Aug. 1990

All directions

period(s)	0.9	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	Total
height(m)	0.9	1.9	2.9	3.9	4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	15.9	16.9	17.0	(0.1%)
.19			7	12	2														21
.20-.39			1	26	37	6													70
.40-.59			1	14	77	7													99
.60-.79				11	38	32													81
.80-.99				1	25	30	2												58
1.00-1.19					5	16	3	1											25
1.20-1.39							8	2											10
1.40-1.59							2	3											5
1.60-1.79							1	2											3
1.80-1.99																			0
2.00-2.19																			0
2.20-2.39																			0
2.40-2.59																			0
2.60-2.79																			0
2.80-2.99																			0
3.00-3.19																			0
3.20-3.39																			0
3.40-3.59																			0
3.60-3.79																			0
3.80-3.99																			0
4.00-4.19																			0
4.20-4.39																			0
4.40-4.59																			0
4.60-4.79																			0
4.80-																			0
Total	0	0	9	64	184	102	12	1	0	0	0	0	0	0	0	0	0	0	372
(0.1%)	(0)	(0)	(24)	(172)	(495)	(274)	(32)	(3)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																			calm
																			recordless
																			0
																			0

Table 5-3-1(h) Wave Occurrence

PHLYOS Sep 1990
All directions

period(s) height(m)	0.9-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.20-.39	4	17	23															44 (122)
.40-.59	6	42	67	9	1													125 (347)
.60-.79		11	24	26	3													64 (178)
.80-.99			5	13	14	6												38 (106)
1.00-1.19				4	10	4												18 (50)
1.20-1.39				3	11	4												18 (50)
1.40-1.59					6	7	4											17 (47)
1.60-1.79					2	5	1											8 (22)
1.80-1.99					2	3	4											9 (25)
2.00-2.19						8	2	1										11 (31)
2.20-2.39							3	1										4 (11)
2.40-2.59							1	1										2 (6)
2.60-2.79								1										1 (3)
2.80-2.99																		1 (3)
3.00-3.19																		0 (0)
3.20-3.39																		0 (0)
3.40-3.59																		0 (0)
3.60-3.79																		0 (0)
3.80-3.99																		0 (0)
4.00-4.19																		0 (0)
4.20-4.39																		0 (0)
4.40-4.59																		0 (0)
4.60-4.79																		0 (0)
4.80-																		0 (0)
total (0.1%)	0 (0)	10 (28)	75 (208)	134 (372)	80 (222)	42 (117)	16 (44)	3 (8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	360 (1000)
																		calm recordless
																		0 (0)

Table 5-3-1(i) Wave Occurrence

FILYOS Oct 1990
All directions

period(s)	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	total	
height(m)	0-0.9	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	(0.1%)
.19	1	21	22	42														86	(231)
.20-.39		10	7	25	23													65	(175)
.40-.59		1	2	12	30	1												46	(124)
.60-.79			2	8	21	11												42	(113)
.80-.99				10	27	13												50	(134)
1.00-1.19				3	12	15	1											31	(83)
1.20-1.39				1	11	10												22	(59)
1.40-1.59					2	9												11	(30)
1.60-1.79					1	5	2											8	(22)
1.80-1.99					1	3	3											7	(19)
2.00-2.19						3	1											4	(11)
2.20-2.39																		0	(0)
2.40-2.59																		0	(0)
2.60-2.79																		0	(0)
2.80-2.99																		0	(0)
3.00-3.19																		0	(0)
3.20-3.39																		0	(0)
3.40-3.59																		0	(0)
3.60-3.79																		0	(0)
3.80-3.99																		0	(0)
4.00-4.19																		0	(0)
4.20-4.39																		0	(0)
4.40-4.59																		0	(0)
4.60-4.79																		0	(0)
4.80-																		0	(0)
total	0	1	32	33	101	128	70	7	0	0	0	0	0	0	0	0	0	372	(1000)
(0.1%)	(0)	(3)	(86)	(89)	(272)	(344)	(188)	(19)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
																		calm	0
																		recordless	0
																			0

Table 5-3-2(a) Wave Occurrence

FILYOS Feb 1990 (6-18h)

All directions

period(s) height(m)	Wave Occurrence																	Total (0.1%)	
	0.9-1.0	1.0-1.9	2.0-2.9	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0		17.0-18.0
.20-.39				5	15	2													22 (.130)
.40-.59				12	29	4													45 (.265)
.60-.79			1	7	10	5													23 (.136)
.80-.99				4	12	7	3												26 (.154)
1.00-1.19						6	11	7											24 (.142)
1.20-1.39						4	12	2											18 (.107)
1.40-1.59							4	4	1										9 (.053)
1.60-1.79																			0 (.000)
1.80-1.99							1	1											2 (.012)
2.00-2.19																			0 (.000)
2.20-2.39																			0 (.000)
2.40-2.59																			0 (.000)
2.60-2.79																			0 (.000)
2.80-2.99																			0 (.000)
3.00-3.19																			0 (.000)
3.20-3.39																			0 (.000)
3.40-3.59																			0 (.000)
3.60-3.79																			0 (.000)
3.80-3.99																			0 (.000)
4.00-4.19																			0 (.000)
4.20-4.39																			0 (.000)
4.40-4.59																			0 (.000)
4.60-4.79																			0 (.000)
4.80-																			0 (.000)
Total	0	0	6	38	63	44	17	1	0	0	0	0	0	0	0	0	0	0	169 (0.1%)
	(0)	(0)	(36)	(225)	(373)	(260)	(101)	(6)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																			calm records 27(13%)

Table 5-3-2(b) Wave Occurrence

FILYOS Mar 1990 (6-18h)
All directions

period(s)	0.0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	Total
height(m)	0.0-1.9	1.9-2.9	2.9-3.9	3.9-4.9	4.9-5.9	5.9-6.9	6.9-7.9	7.9-8.9	8.9-9.9	9.9-10.9	10.9-11.9	11.9-12.9	12.9-13.9	13.9-14.9	14.9-15.9	15.9-16.9	16.9-17.0	(0.1%)
.19	1	9	46	16	1													73
.20-.39		6	23	17	1													(336)
.40-.59			12	10	3	1												47
.60-.79			2	8	8	1												(217)
.80-.99			1	5	10	4												26
1.00-1.19				2	3	3												(120)
1.20-1.39					1	3												19
1.40-1.59				1	3	5	1											(88)
1.60-1.79					4	2												20
1.80-1.99						1												(92)
2.00-2.19						1												8
2.20-2.39						1	1											(37)
2.40-2.59																		4
2.60-2.79																		(18)
2.80-2.99																		10
3.00-3.19																		(46)
3.20-3.39																		6
3.40-3.59																		(28)
3.60-3.79																		1
3.80-3.99																		(5)
4.00-4.19																		2
4.20-4.39																		(9)
4.40-4.59																		1
4.60-4.79																		(5)
4.80-																		0
total	0	15	87	59	34	21	3	0	0	0	0	0	0	0	0	0	0	0
(0.1%)	(0)	(5)	(387)	(272)	(137)	(97)	(14)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
																		calm
																		recordless
																		0
																		0

Table 5-3-2(c) Wave Occurrence

FILYOS Apr 1990 (6-18h)

All directions

period(s)	0.9-1.9	1.9-2.9	2.9-3.9	3.9-4.9	4.9-5.9	5.9-6.9	6.9-7.9	7.9-8.9	8.9-9.9	9.9-10.9	10.9-11.9	11.9-12.9	12.9-13.9	13.9-14.9	14.9-15.9	15.9-16.9	16.9-17.9	Total	
height(m)	0-1.9	1.9-2.9	2.9-3.9	3.9-4.9	4.9-5.9	5.9-6.9	6.9-7.9	7.9-8.9	8.9-9.9	9.9-10.9	10.9-11.9	11.9-12.9	12.9-13.9	13.9-14.9	14.9-15.9	15.9-16.9	16.9-17.9	(0.1%)	
.19	0	15	27	18	0	0	0	0	0	0	0	0	0	0	0	0	0	60	
.20-.39	0	8	35	24	1	0	0	0	0	0	0	0	0	0	0	0	0	68	
.40-.59	0	2	27	15	5	0	0	0	0	0	0	0	0	0	0	0	0	49	
.60-.79	0	0	1	6	3	0	0	0	0	0	0	0	0	0	0	0	0	10	
.80-.99	0	0	0	4	6	1	0	0	0	0	0	0	0	0	0	0	0	11	
1.00-1.19	0	0	0	0	5	2	1	0	0	0	0	0	0	0	0	0	0	8	
1.20-1.39	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	4	
1.40-1.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1.60-1.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1.80-1.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.00-2.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.20-2.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.40-2.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.60-2.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2.80-2.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.00-3.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.20-3.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.40-3.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.60-3.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3.80-3.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.00-4.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.20-4.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.40-4.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.60-4.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4.80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	25	90	67	21	6	1	0	0	0	0	0	0	0	0	0	0	210	
(0.1%)	(0)	(119)	(429)	(319)	(100)	(29)	(5)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)	
																		calm	0(0)
																		recordless	0(0)

Table 5-3-2(d) Wave Occurrence

FILYOS May 1990 (6 -18h)

All directions

period(s) height(m)	0.9 - 1.0	1.0 - 2.0	2.0 - 3.0	3.0 - 4.0	4.0 - 5.0	5.0 - 6.0	6.0 - 7.0	7.0 - 8.0	8.0 - 9.0	9.0 - 10.0	10.0 - 11.0	11.0 - 12.0	12.0 - 13.0	13.0 - 14.0	14.0 - 15.0	15.0 - 16.0	16.0 - 17.0	Total (0.1%)
.20- .39	1	14	29	6														50 (230)
.40- .59		5	18	21														44 (203)
.60- .79			1	9	18	2												30 (138)
.80- .99				4	15	12												31 (143)
1.00- 1.19				1	14	13	3											31 (143)
1.20- 1.39					6	8	3											17 (78)
1.40- 1.59					3	2	3											8 (37)
1.60- 1.79						1	2											3 (14)
1.80- 1.99						1	1											2 (9)
2.00- 2.19							1											1 (5)
2.20- 2.39																		0 (0)
2.40- 2.59																		0 (0)
2.60- 2.79																		0 (0)
2.80- 2.99																		0 (0)
3.00- 3.19																		0 (0)
3.20- 3.39																		0 (0)
3.40- 3.59																		0 (0)
3.60- 3.79																		0 (0)
3.80- 3.99																		0 (0)
4.00- 4.19																		0 (0)
4.20- 4.39																		0 (0)
4.40- 4.59																		0 (0)
4.60- 4.79																		0 (0)
4.80-																		0 (0)
Total (0.1%)	0 (0)	5 (92)	20 (281)	61 (383)	83 (166)	36 (166)	11 (51)	5 (23)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	217 (1000)
																		cal ^m records 0 (0)

Table 5-3-2(e) Wave Occurrence

FLYOS Jun 1990 (6-18h)

All directions

period(s) height(m)	0-0.9	0.9-1.9	1.9-2.9	2.9-3.9	3.9-4.9	4.9-5.9	5.9-6.9	6.9-7.9	7.9-8.9	8.9-9.9	9.9-10.9	10.9-11.9	11.9-12.9	12.9-13.9	13.9-14.9	14.9-15.9	15.9-16.9	16.9-17.9	Total (0.1%)
.19	0	1	20	72	4														97 (.462)
.20-.39			9	18	16														43 (.205)
.40-.59			1	17	9	2													29 (.138)
.60-.79				3	4	4													11 (.052)
.80-.99				1		6													7 (.033)
1.00-1.19					2	3	2												7 (.033)
1.20-1.39						1	5												6 (.029)
1.40-1.59							2												2 (.010)
1.60-1.79							1	2											3 (.014)
1.80-1.99																			0 (.000)
2.00-2.19								1	1										2 (.010)
2.20-2.39									1										1 (.005)
2.40-2.59									1										1 (.005)
2.60-2.79									1										1 (.005)
2.80-2.99																			0 (.000)
3.00-3.19																			0 (.000)
3.20-3.39																			0 (.000)
3.40-3.59																			0 (.000)
3.60-3.79																			0 (.000)
3.80-3.99																			0 (.000)
4.00-4.19																			0 (.000)
4.20-4.39																			0 (.000)
4.40-4.59																			0 (.000)
4.60-4.79																			0 (.000)
4.80																			0 (.000)
Total (0.1%)	0	1	30	111	35	15	10	3	4	0	0	0	0	0	0	0	0	0	210 (.1000)
	0	5	143	529	167	76	48	14	19	0	0	0	0	0	0	0	0	0	calm records (.00)

Table 5-3-2(f) Wave Occurrence

FILOS Jul 1990 (6 -18h)

All directions

period(s)	0.9 - 1.9	2.0 - 3.0	4.0 - 5.0	6.0 - 7.0	8.0 - 9.0	10.0 - 11.0	12.0 - 13.0	14.0 - 15.0	16.0 - 17.0	Total
height(m)	0.9 - 1.9	2.0 - 3.0	4.0 - 5.0	6.0 - 7.0	8.0 - 9.0	10.0 - 11.0	12.0 - 13.0	14.0 - 15.0	16.0 - 17.0	(0.1%)
.19	6	6								(12)
.20 - .39	1	24	30							(55)
.40 - .59	1	14	36	7						(234)
.60 - .79		4	18	13						(58)
.80 - .99		1	11	17	1					(35)
1.00 - 1.19			3	12	6					(30)
1.20 - 1.39			1	2						(138)
1.40 - 1.59				1						(21)
1.60 - 1.79				1						(97)
1.80 - 1.99				1						(3)
2.00 - 2.19										(14)
2.20 - 2.39										(5)
2.40 - 2.59										(5)
2.60 - 2.79										(5)
2.80 - 2.99										(5)
3.00 - 3.19										(0)
3.20 - 3.39										(0)
3.40 - 3.59										(0)
3.60 - 3.79										(0)
3.80 - 3.99										(0)
4.00 - 4.19										(0)
4.20 - 4.39										(0)
4.40 - 4.59										(0)
4.60 - 4.79										(0)
4.80 -										(0)
Total	0	8	49	99	52	9	0	0	0	0
(0.1%)	(0)	(37)	(226)	(456)	(240)	(42)	(0)	(0)	(0)	(0)
Recordless	0	0	0	0	0	0	0	0	0	0
	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)

Table 5-3-2(h) Wave Occurrence

PILYOS Sep 1990 (6-18h)
All directions

period(s) height(m)	0.9-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.20-.39	3	6	18															27 (129)
.40-.59	3	32	35	3														73 (348)
.60-.79		8	10	16	2													36 (171)
.80-.99		4	9	5	4													22 (105)
1.00-1.19				4	6	3												13 (62)
1.20-1.39					2	5	2											9 (43)
1.40-1.59					2	4	2											8 (38)
1.60-1.79					1	1	1											3 (14)
1.80-1.99					2	2	2											6 (29)
2.00-2.19							6	1										7 (33)
2.20-2.39								2	1									3 (14)
2.40-2.59									1									1 (5)
2.60-2.79										1								1 (5)
2.80-2.99																		1 (5)
3.00-3.19																		1 (5)
3.20-3.39																		1 (5)
3.40-3.59																		1 (5)
3.60-3.79																		1 (5)
3.80-3.99																		1 (5)
4.00-4.19																		1 (5)
4.20-4.39																		1 (5)
4.40-4.59																		1 (5)
4.60-4.79																		1 (5)
4.80-																		1 (5)
Total (0.1%)	0 (0)	6 (29)	50 (238)	78 (371)	40 (191)	24 (114)	10 (48)	2 (10)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	210 (1000)
																		calm records
																		0 (0)

Table 5-3-2(i) Wave Occurrence

FILYOS Oct 1990 (6-18h)

All directions

period(s) height(m)	Wave Occurrence												Total (0.1%)					
	0.9-1.9	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0		12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0
0.20-0.39	7	1	16	12														53 (244)
0.40-0.59	1	2	10	16	1													36 (166)
0.60-0.79		2	2	7	7													30 (138)
0.80-0.99			7	17	8													18 (83)
1.00-1.19			3	8	6													32 (148)
1.20-1.39			1	6	3													17 (78)
1.40-1.59				2	8													10 (46)
1.60-1.79				1	5	1												10 (46)
1.80-1.99					2	1												7 (32)
2.00-2.19						1												3 (14)
2.20-2.39																		1 (5)
2.40-2.59																		0 (0)
2.60-2.79																		0 (0)
2.80-2.99																		0 (0)
3.00-3.19																		0 (0)
3.20-3.39																		0 (0)
3.40-3.59																		0 (0)
3.60-3.79																		0 (0)
3.80-3.99																		0 (0)
4.00-4.19																		0 (0)
4.20-4.39																		0 (0)
4.40-4.59																		0 (0)
4.60-4.79																		0 (0)
4.80-																		0 (0)
total (0.1%)	0 (0)	0 (83)	21 (97)	56 (304)	69 (318)	41 (189)	2 (9)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	217 (1000)
																		calm recordless
																		0 (0)

Table 5-3-2(j) Wave Occurrence

FILYOS Nov 1990 (6-18h)

All directions

period(s) height(m)	0-0.9	1.0-1.9	2.0-2.9	3.0-3.9	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0-8.9	9.0-9.9	10.0-10.9	11.0-11.9	12.0-12.9	13.0-13.9	14.0-14.9	15.0-15.9	16.0-16.9	17.0-17.9	Total (0.1%)
.20-.39	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7 (.81)
.40-.59	8	16	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30 (.343)
.60-.79	7	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12 (.138)
.80-.99	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6 (.69)
1.00-1.19	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4 (.46)
1.20-1.39	4	7	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14 (.161)
1.40-1.59	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6 (.69)
1.60-1.79	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 (.35)
1.80-1.99	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 (.35)
2.00-2.19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
2.20-2.39	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 (.12)
2.40-2.59	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1 (.12)
2.60-2.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
2.80-2.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
3.00-3.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
3.20-3.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
3.40-3.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
3.60-3.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
3.80-3.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
4.00-4.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
4.20-4.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
4.40-4.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
4.60-4.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
4.80-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 (.0)
Total (0.1%)	35	35	29	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	87 (.1000)
																			calm recordless
																			0 (.0)
																			0 (.0)

Table 5-3-3(a) Wave Occurrence

FILYOS Feb 1990 (19- 5h)

All directions

period(s)	0.0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	total
height(m)	0.0-1.0	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	(0.1%)
.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
.20- .39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(189)
.40- .59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
.60- .79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(164)
.80- .99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
1.00- 1.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(197)
1.20- 1.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
1.40- 1.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(131)
1.60- 1.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
1.80- 1.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(123)
2.00- 2.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
2.20- 2.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(131)
2.40- 2.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
2.60- 2.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(33)
2.80- 2.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3.00- 3.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(16)
3.20- 3.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
3.40- 3.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(16)
3.60- 3.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.80- 3.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.00- 4.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.20- 4.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.40- 4.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.60- 4.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.80-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	0	6	18	35	38	21	4	0	0	0	0	0	0	0	0	0	0	122
(0.1%)	(0)	(19)	(148)	(287)	(312)	(172)	(33)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
cal ^m recordless	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18

Table 5-3-3(b) Wave Occurrence

FILYOS Mar 1990 (19- 5h)

All directions

period(s)	0.9	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	Total
height(m)	0.9	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	(0.1%)
.19	2	3	23	21															49
.20-.39			2	10	19	1													(315)
.40-.59				4	13	6													(207)
.60-.79						8	8	1											(148)
.80-.99						2	4												(110)
1.00-1.19						1	3	7											(39)
1.20-1.39								7											(71)
1.40-1.59								3											(45)
1.60-1.79								1	1										(19)
1.80-1.99								2	1										(13)
2.00-2.19																			(19)
2.20-2.39																			(3)
2.40-2.59																			(2)
2.60-2.79																			(13)
2.80-2.99																			(3)
3.00-3.19																			(19)
3.20-3.39																			(2)
3.40-3.59																			(13)
3.60-3.79																			(3)
3.80-3.99																			(19)
4.00-4.19																			(0)
4.20-4.39																			(0)
4.40-4.59																			(0)
4.60-4.79																			(0)
4.80-																			(0)
Total	0	2	5	37	64	22	21	4	0	0	0	0	0	0	0	0	0	0	155
(0.1%)	(0)	(13)	(32)	(239)	(413)	(142)	(136)	(26)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																			calm
																			recordless
																			(0)
																			(0)

Table 5-3-3(c) Wave Occurrence

FILYOS Apr 1980 (19-5h)

All directions

period(s)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	Total
height(m)	0.9-1.9	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	17.0-18.0	(0.1%)
.19	0	10	35	9	0	0	0	0	0	0	0	0	0	0	0	0	0	54
.20-.39	0	4	25	12	2	0	0	0	0	0	0	0	0	0	0	0	0	(360)
.40-.59	0	0	8	8	9	0	0	0	0	0	0	0	0	0	0	0	0	43
.60-.79	0	0	1	1	8	2	0	0	0	0	0	0	0	0	0	0	0	25
.80-.99	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	12
1.00-1.19	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	(80)
1.20-1.39	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	(47)
1.40-1.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(53)
1.60-1.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(7)
1.80-1.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.00-2.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.20-2.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.40-2.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.60-2.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.80-2.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.00-3.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.20-3.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.40-3.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.60-3.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.80-3.99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.00-4.19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.20-4.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.40-4.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.60-4.79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.80-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
Total	0	14	69	30	23	14	0	0	0	0	0	0	0	0	0	0	0	150
(0.1%)	(0)	(93)	(460)	(200)	(153)	(93)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																		calm
																		recordless
																		(0)
																		(0)

Table 5-3-3(d) Wave Occurrence

PILYOS May 1990 (19- 5h)

All directions

period(s)	0.9 - 1.0	1.0 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	Total
height(m)	0.9 - 1.0	1.0 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	(0.1%)
.19	0	0	14	21	2														37
.20- .39	0	0	3	21	7														(239)
.40- .59	0	0	0	8	17	3													31
.60- .79	0	0	0	0	8	12													(200)
.80- .99	0	0	0	1	2	12	2												28
1.00- 1.19	0	0	0	0	2	5	6												(181)
1.20- 1.39	0	0	0	0	0	2	1	1											20
1.40- 1.59	0	0	0	0	0	0	3												(129)
1.60- 1.79	0	0	0	0	0	0	1	1											17
1.80- 1.99	0	0	0	0	0	0	0	0											(110)
2.00- 2.19	0	0	0	0	0	0	0	0											13
2.20- 2.39	0	0	0	0	0	0	0	0											(84)
2.40- 2.59	0	0	0	0	0	0	0	0											4
2.60- 2.79	0	0	0	0	0	0	0	0											(26)
2.80- 2.99	0	0	0	0	0	0	0	0											3
3.00- 3.19	0	0	0	0	0	0	0	0											(19)
3.20- 3.39	0	0	0	0	0	0	0	0											2
3.40- 3.59	0	0	0	0	0	0	0	0											(13)
3.60- 3.79	0	0	0	0	0	0	0	0											0
3.80- 3.99	0	0	0	0	0	0	0	0											(0)
4.00- 4.19	0	0	0	0	0	0	0	0											(0)
4.20- 4.39	0	0	0	0	0	0	0	0											(0)
4.40- 4.59	0	0	0	0	0	0	0	0											(0)
4.60- 4.79	0	0	0	0	0	0	0	0											(0)
4.80-	0	0	0	0	0	0	0	0											(0)
total	0	0	17	51	38	34	13	2	0	0	0	0	0	0	0	0	0	0	155
(0.1%)	(0)	(0)	(119)	(329)	(243)	(219)	(84)	(13)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)

calculated recordless (0) (0)

Table 5-3-3(e) Wave Occurrence

FILYOS Jun 1990 (19- 5h)
All directions

period(s)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	Total
height(m)	0.9 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	(0.1%)
.20- .39	3	21	32	7	1													64
.40- .59			25	19														(427)
.60- .79			4	2	1													44
.80- .99			1	3	3													(293)
1.00- 1.19			1	1	5	3												(47)
1.20- 1.39					1	4												(47)
1.40- 1.59						6												10
1.60- 1.79						1												(67)
1.80- 1.99																		5
2.00- 2.19																		(33)
2.20- 2.39																		6
2.40- 2.59																		(40)
2.60- 2.79																		1
2.80- 2.99																		(7)
3.00- 3.19																		1
3.20- 3.39																		(7)
3.40- 3.59																		0
3.60- 3.79																		0
3.80- 3.99																		0
4.00- 4.19																		0
4.20- 4.39																		0
4.40- 4.59																		0
4.60- 4.79																		0
4.80-																		0
Total	0	3	21	63	32	12	14	0	5	0	0	0	0	0	0	0	0	150
(0.1%)	(0)	(20)	(140)	(420)	(213)	(80)	(93)	(0)	(33)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																		calm
																		recordless
																		(0)
																		(0)

Table 5-3-3(f) Wave Occurrence

FILYOS Jul 1980 (19-5h)

All directions

period(s)	1.0-2.0	3.0-4.0	5.0-6.0	7.0-8.0	9.0-10.0	11.0-12.0	13.0-14.0	15.0-16.0	17.0-18.0	Total
height(m)	0.9-1.9	2.0-3.0	4.0-5.0	6.0-7.0	8.0-9.0	10.0-11.0	12.0-13.0	14.0-15.0	16.0-17.0	(0.1%)
.19	2	5								7
.20	1	19	17							46
.40		9	32	3						37
.60		1	19	10						44
.80			2	17						286
1.00			1	3	3					30
1.20				1	5					195
1.40				1	1					19
1.60					1					123
1.80					1					46
2.00										6
2.20										39
2.40										2
2.60										13
2.80										7
3.00										1
3.20										7
3.40										0
3.60										0
3.80										0
4.00										0
4.20										0
4.40										0
4.60										0
4.80										0
Total	0	3	34	71	35	11	0	0	0	154
(0.1%)	(0)	(20)	(221)	(461)	(227)	(71)	(0)	(0)	(0)	(1000)

calculated recordless (97)

Table 5-3-3(g) Wave Occurrence

FILYOS Aug 1990 (19-5h)

All directions

period(s)	1.0-2.0	2.0-3.0	3.0-4.0	4.0-5.0	5.0-6.0	6.0-7.0	7.0-8.0	8.0-9.0	9.0-10.0	10.0-11.0	11.0-12.0	12.0-13.0	13.0-14.0	14.0-15.0	15.0-16.0	16.0-17.0	Total	
height(m)	0.9-1.9	1.9-2.9	2.9-3.9	3.9-4.9	4.9-5.9	5.9-6.9	6.9-7.9	7.9-8.9	8.9-9.9	9.9-10.9	10.9-11.9	11.9-12.9	12.9-13.9	13.9-14.9	14.9-15.9	15.9-16.9	17.0	(0.1%)
.19	0	0	2	5	1													8
.20-.39	0	0	11	12	3													26
.40-.59	0	0	5	34	4													43
.60-.79	0	0	0	14	17													31
.80-.99	0	0	0	0	9	16												25
1.00-1.19	0	0	0	0	1	10	1											13
1.20-1.39	0	0	0	0	0	4	1											5
1.40-1.59	0	0	0	0	0	0	2											2
1.60-1.79	0	0	0	0	0	0	2											2
1.80-1.99	0	0	0	0	0	0	0											0
2.00-2.19	0	0	0	0	0	0	0											0
2.20-2.39	0	0	0	0	0	0	0											0
2.40-2.59	0	0	0	0	0	0	0											0
2.60-2.79	0	0	0	0	0	0	0											0
2.80-2.99	0	0	0	0	0	0	0											0
3.00-3.19	0	0	0	0	0	0	0											0
3.20-3.39	0	0	0	0	0	0	0											0
3.40-3.59	0	0	0	0	0	0	0											0
3.60-3.79	0	0	0	0	0	0	0											0
3.80-3.99	0	0	0	0	0	0	0											0
4.00-4.19	0	0	0	0	0	0	0											0
4.20-4.39	0	0	0	0	0	0	0											0
4.40-4.59	0	0	0	0	0	0	0											0
4.60-4.79	0	0	0	0	0	0	0											0
4.80	0	0	0	0	0	0	0											0
Total	0	0	2	21	71	54	6	1	0	0	0	0	0	0	0	0	0	155
(0.1%)	(0)	(0)	(13)	(136)	(458)	(348)	(39)	(7)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																		calm
																		recordless
																		(0)
																		(0)

Table 5-3-3(i) Wave Occurrence

FILYOS Oct 1990 (19-5h)

All directions

period(s) height(m)	0.9 - 1.0	1.0 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	Total (0.1%)	
20-39	1	11	6	15															33 (213)	
40-59		3	6	9	11														29 (187)	
60-79				2	14														16 (103)	
80-99					6	14	4												24 (155)	
1.00-1.19					3	10	5												18 (116)	
1.20-1.39						4	9	1											14 (90)	
1.40-1.59							5	7											12 (77)	
1.60-1.79								1											1 (7)	
1.80-1.99							1	1	2										4 (26)	
2.00-2.19								2	1	1									3 (19)	
2.20-2.39																			0 (0)	
2.40-2.59																			0 (0)	
2.60-2.79																			0 (0)	
2.80-2.99																			0 (0)	
3.00-3.19																			0 (0)	
3.20-3.39																			0 (0)	
3.40-3.59																			0 (0)	
3.60-3.79																			0 (0)	
3.80-3.99																			0 (0)	
4.00-4.19																			0 (0)	
4.20-4.39																			0 (0)	
4.40-4.59																			0 (0)	
4.60-4.79																			0 (0)	
4.80-																			0 (0)	
total (0.1%)	0 (0)	4 (7)	14 (90)	12 (77)	35 (226)	59 (381)	29 (187)	5 (32)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	155 (1000)	
																			calm recordless	0 (0)

Table 5-3-3(j) Wave Occurrence

FILOS Nov 1990 (19- 5h)
All directions

period(s) height(m)	0.9 - 1.9	2.0 - 2.9	3.0 - 3.9	4.0 - 4.9	5.0 - 5.9	6.0 - 6.9	7.0 - 7.9	8.0 - 8.9	9.0 - 9.9	10.0 - 10.9	11.0 - 11.9	12.0 - 12.9	13.0 - 13.9	14.0 - 14.9	15.0 - 15.9	16.0 - 16.9	17.0 - 17.9	Total (0.1%)	
.20- .30	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	(143)
.40- .50	6	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	(322)
.60- .70	1	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	(79)
.80- .90	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	(48)
1.00- 1.10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	(64)
1.20- 1.30	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	(159)
1.40- 1.50	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	(111)
1.60- 1.70	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	(32)
1.80- 1.90	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	(15)
2.00- 2.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.20- 2.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.40- 2.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.60- 2.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
2.80- 2.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.00- 3.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.20- 3.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.40- 3.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.60- 3.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
3.80- 3.90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.00- 4.10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.20- 4.30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.40- 4.50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.60- 4.70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
4.80-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(0)
Total (0.1%)	0	0	3	10	28	13	9	0	0	0	0	0	0	0	0	0	0	0	63
	(0)	(0)	(48)	(159)	(444)	(206)	(143)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1000)
																			calm records
																			(0)

Turkish Free Trade Zones

by M. Ali Sulutaş, M.B.A.
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The free zone idea is not new in Turkey. Several attempts have been made in the last 60 years, until the very beginning of 1987, when the Mersin Free Zone was officially inaugurated. Considering that it took 40 years in the United States to get the first free zone going in that country, the Mersin Free Zone is one of the recent achievements in the Turkish Economy's "success story".

The second Turkish Free Zone came into operation in Antalya early in 1988. Other Free zones are being planned in Adana and İzmir on a larger scale and will be predominantly industry-oriented. Both of these zones will be managed by United States based multi-national companies.

All of these zones are located on the Mediterranean coast, adjacent to the largest Turkish seaports. The zones are also conveniently connected with high-

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ways, railways and airports. Moreover, the zones are situated near attractive urban, cultural, touristic, recreational and entertainment centers. In these regions a mild winter is observed. Yet, the mountains are snowcovered 10-70 kms from the shore. Enjoy winter sports up on the mountains, sun-bathe down on the beaches, and stroll through the citrus orchards!...

A dominant factor in the economic and social life of Turkey is the country's gateway function, providing access to world trade and transit routes. Economic and regional development, increased employment and foreign exchange earnings, technological and managerial transfers are among the national objectives.

One of the zones, aim is to improve the one-stop shopping services, by eliminating unnecessary steps in dealing with government. Besides the availability of trainable low cost labour,

Incentives: Turkish free zones offer packages of incentives and opportunities unmatched in the Eastern Mediterranean. In cases where new incentives are deemed necessary to enhance the competitive position of the free zones, existing users will be able to benefit fully from any such adjustments.

the incentives in Turkey are the political stability, the industrial peace, and a rapid turnaround time for products by faster import and export procedures.

Attracting foreign investment in a Turkish economy of free enterprise, particularly in the free zones, has many advantages. Turkey, or Asia Minor, as it was called in early times had always been a East to West, North to South road-junction for merchants, adventurers and sailors. In modern times she holds, more than ever, her strategic position economically and politically.

The Turkish government was smart enough to enact its Free Trade Zones Act in 1985. It arranged for each of its operating and planned zones to supply a number of services to the zone users.

Some of the facts about the Turkish free zones are the following:

Encouragement of Foreign Investment: There will be no limitation on the proportion of foreign capital participation in the free zones. The liberal economic policies of the Turkish government fully encourage free enterprise competition and foreign investment. Currently more than 400 foreign corporations and about 20 international banks operate in Turkey.

Tax Exemptions: Investors may bring into the free zones any inputs they require from foreign locations without being subject to any taxes, duties or tolls. No income taxes will be levied upon the salaries of those working within the zones. The free zone origin profits of those entities operating within the zones are not subject to either income or corporate taxes and duties.

Incentives: Turkish free zones offer

packages of incentives and opportunities unmatched in the Eastern Mediterranean. In cases where new incentives are deemed necessary to enhance the competitive position of the free zones, existing users will be able to benefit fully from any such adjustments.

Market Conditions: The zones are strategically located with easy access to the export markets of the Middle East, North Africa and Europe. Moreover Turkey with a population of 55 million, possesses a dynamic domestic market.

Employment and Working Conditions: For a period of ten years strikes and lockouts will not be permitted in the zones. However, within the framework of Turkish labour laws, unionisation of labour and collective bargaining will be permissible. Further-

more, foreign managers and qualified personnel can be employed by companies operating in the zones.

Leasing and Rates: Investors may lease parcels for USD 2.00 per square meter per year. Closed areas, stores and offices are also available for rent at USD 3.00 per square meter per month.

Infrastructure of the Zones: The Turkish government will provide the infrastructure at no charge to the investors. The zones are well served by international transportation and telecommunication networks.

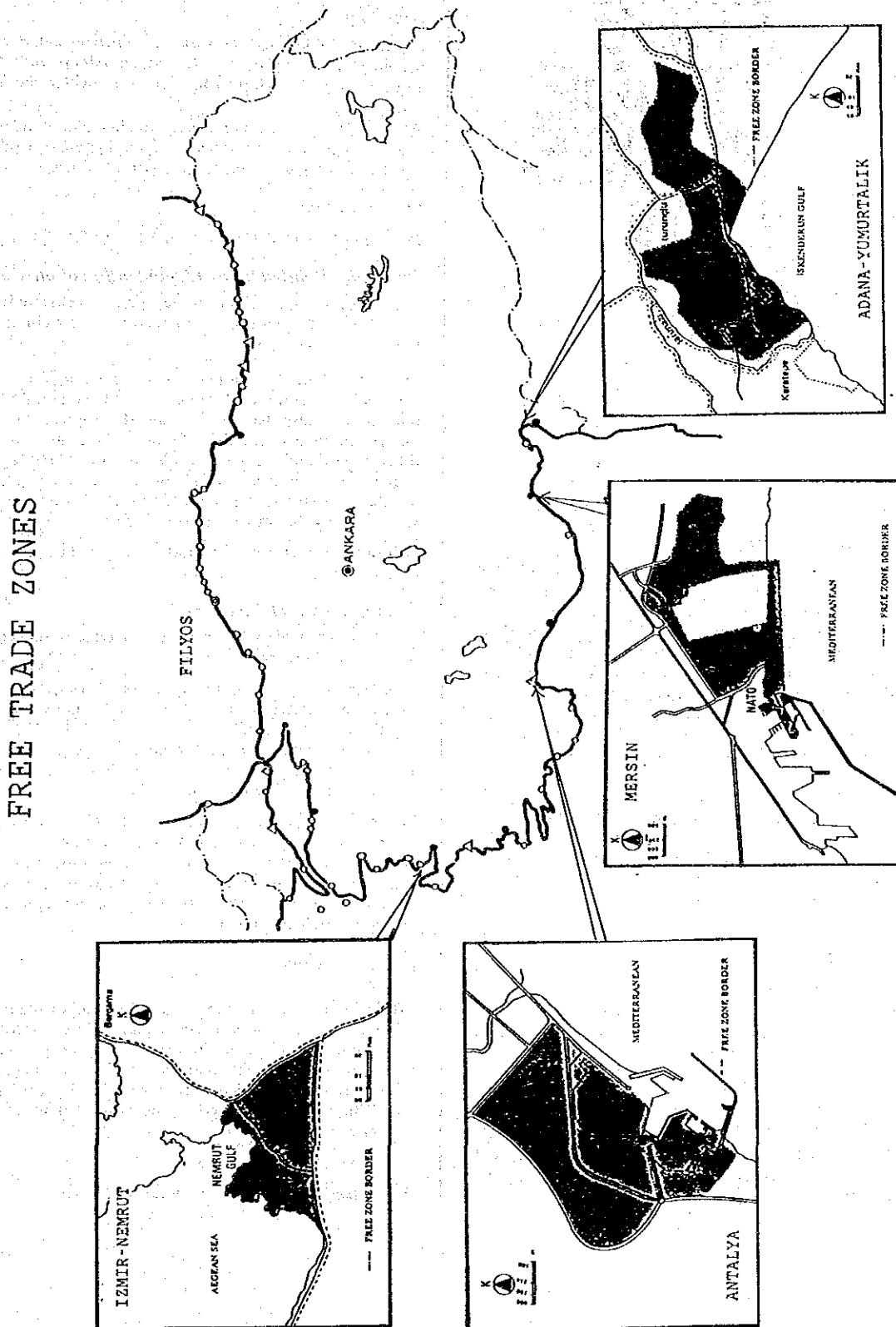
Zone Administration: The central administration of free zones is conducted by the Undersecretariat of the State Planning Organisation. The Regional Zone Directorate, responsible for all policy decisions pertaining to local zones, has sole discretion in granting

licences for operations in the zone.

Zone Management: Private sector management companies have been established to operate the zones and to provide services in a timely and efficient manner.

Conclusion: There are at least two important elements for the success of a free zone: one is that the management of the zone should be done by private enterprise. Another is that within the free zone the fiscal and regulatory burden on business must be greatly reduced. With these two vital ingredients along with the other elements, the Turkish free zones will make Turkey one of the busiest world trade centres in the very near future. Ambitious investors will discover new and brilliant horizons. Turkey's free zones offer climate, hospitality and more importantly, business opportunities.

Appendix 8-2 Turkish Free Trade Zones(Figure)



FREE TRADE ZONES LAW

Law No. : 3218

Approved : 6 June 1985
Issued : 15 June 1985

SECTION ONE

GENERAL PROVISIONS

Objectives and Content

Article 1 : This Law encompasses the matters related to the establishment of free trade zones; the determination of their location and boundaries; their management; the scope of their activities; their operation; and the establishment of the installations and facilities within the zone : with the objective of increasing export-oriented investment and production in Turkey; accelerating the entry of foreign capital and technology; procuring the inputs of the economy in an economic and orderly fashion; and increasing the utilization of external finance and trade possibilities.

Authority

Article 2 : The Council of Ministers is empowered with the authority to determine the location and the boundaries of the free trade zones. The Council of Ministers grants permission for the establishment and operation of free trade zones to public institutions and agencies, resident or non-resident real persons or legal entities.

Definitions

Article 3 : In the implementation of this Law:

- a) "Operator" signifies the public institution and agency; the resident and non-resident real persons or legal entities operating the free trade zone.
- b) "User" signifies the real and legal person bearing an Operating License and having a specific place of business within the free trade zone.
- c) "Foreign exchange" refers to all currencies, or all types of accounts or bills, considered as being convertible by the Central Bank of the Republic of Turkey.

Activities

Article 4 : All kinds of industrial, commercial and service activities approved by the Economic Affairs supreme Coordination Council may be carried out within the free trade zones.

Any authority regarding prices, quality and standards granted to public institutions and agencies by laws or other legislation will not be valid in the free trade zones.

SECTION TWO

ORGANIZATIONS OF THE FREE TRADE ZONES

Principles Related to the Organization of the Zone

Article 5 : Land and facilities needed within the declared free trade zones can be acquired pursuant to the provisions of the Expropriation Law.

Domestic or foreign real persons or legal entities may be active within the free trade zones on the condition that an operating license has been granted to them by the Undersecretariat of the State Planning Organization. All other permits and licenses regarding the use of land as well as the design, construction and utilization of buildings and installations within the free trade zone shall be issued and supervised by the regional directorate.

Security services for the free trade zones shall be provided by the police.

Exemptions and Incentives

Article 6 : The free trade zones are deemed to be outside of the customs borders.

Legislative provisions pertaining to taxes, levies, duties and to customs and foreign exchange obligations are not applicable in these zones.

During the investment and production stages of their activities, operators and users can qualify for incentives to be determined by the Council of Ministers.

Income and revenues generated in the free trade zones through activities of real persons and legal entities with full or limited tax liability in Turkey, are exempt from income and corporate taxes, provided that the transfer of such income and revenues into Turkey is documented pursuant to foreign exchange regulations.

The FTZ Fund

Article 7 : In order to establish, develop and maintain the free trade zones, to support research and training activities, to construct social facilities, to provide incentives for users and to promote the purchase of goods from Turkey, a "Free Trade Zones Establishment and Development Fund" has been established at the Central Bank of the Republic of Turkey.

Fund resources are as follows:

- a) Fees paid for operating licenses and permits;

b) Fees paid in advance amounting to 0.5 per cent of the CIF value and the FOB value, respectively, of goods entering and leaving the zone.

c) Payments specified in the contracts made with real persons and legal entities managing the free trade zone.

d) Other income.

Goods destined to the free trade zone that originate from Turkey and goods utilized during the investment and construction stages, as well as instruments, tools and equipment brought into the free trade zone for repair and maintenance purposes, are exempt from the payments specified in paragraph (b) of this Article.

Procedures and principles governing Fund collections and disbursements are specified by regulations. This Fund is administered by the Prime Ministry. The Fund is audited by the Superior Audit Council of the Prime Ministry.

SECTION THREE

GOODS AND SERVICES

Goods in the Free Trade Zones

Article 8 : Trade conducted between the free trade zone and other regions of Turkey is subject to the foreign trade regime. Upon request, goods originating from Turkey of less than 500 US dollars value may be exempted from export procedures. The foreign trade regime is not applicable for trade conducted between the free trade zones and other countries or free trade zones.

Foreign Exchange and Services

Article 9 : All payments related to free trade zone activities are made in the form of foreign exchange. The Council of Ministers may decide that payments be also made in the form of Turkish Lira.

Shipping and port services in the free trade zones are provided either by the operator or assigned to public institutions and agencies or to real or legal persons.

SECTION FOUR

LABOR AND SOCIAL SECURITY, REPEALED AND INAPPLICABLE PROVISIONS, REGULATIONS

Labor and Social Security Provisions

Article 10 : Foreign managers and qualified personnel can be employed by firms operating in the free trade zones. Related principles are specified by governing statutes. The provisions of the social security regulations of the Republic of Turkey are applied in the free trade zones.

Repealed Provisions

Article 11 : The Free Trade Zones Law No. 6209 dated December 21, 1953, is hereby repealed.

Inapplicable Provisions

Article 12 : In the free trade zones, all provisions of

Municipality Law No. 1580 except paragraphs 5, 22, 25, 32 and 47 of Article 15; Passport Law No. 5682; Law No. 5683 for Foreigners Travelling and Residing in Turkey and Law No. 2007 on Professions and Services Allocated for Turkish Citizens including its Annexes and Amendments; Foreign Investment and Encouragement Law No. 6224; Law No. 2677 on the Implementation of Duties and Services at the Civilian Airports, Ports and Border Gates; General Accounting Law No. 1050; Supreme Court of Finance Law No. 832; provisions of the State Bidding Law No. 2886 and provisions of other laws contrary to this Law shall not be applicable.

Governing Statutes Regarding Implementation

Article 13 : Matters in this Law of which regulation has been left to the governing statutes, as well as the organization, duties, authority and responsibilities of those operators who will be active in the free trade zones, and the granting and the cancellation of the operating Licenses that will be provided to these operators and Users; the maintenance of their industrial and commercial registers; the payments they will make to the Fund; the principles governing the conduct of activities in the free trade zone; the zone entry permits and identity cards; permission for residence; and work principles and other matters pertaining to the operation of the free trade zones will be determined by the governing statutes.

Provisional Article 1 : For a period of 10 years following the commencement of operations in the free trade zones, the strike, lockout and mediation provisions of Law No. 2822, dated May 5, 1983, shall not be applicable in the zones.

However, any disputes arising within the context of collective bargaining during this period shall be resolved by the Supreme Arbitration Council.

Provisional Article 2 : This Law will be effective for each free trade zone upon the commencement of that free trade zone's operations.

The date of commencement of operations shall be when the construction of the perimeter fence, tower and gate have been completed and the regional directorate, police and customs units have assumed their duties.

Article 14 : This Law shall go into effect on the date of its publication.

Enforcement

Article 15 : The provisions of this Law shall be enforced by the Council of Ministers.

Fig. 9-7-4(A-1) Protective Facilities, Revetment, Groin and Training Dike

Item	Wave Conditions (H _L /3) (m)	Coping of Crown Elevation (m)	Weight of Dissipating		Weight of Concrete Blocks	Weight of Stones	Circular Failure
			Concrete Blocks	Concrete Blocks			
Port Facilities			$W = \frac{7r \cdot (H)^3}{KD(Sr-1)^3 \text{ coid}} \quad (t)$				$F = \frac{MP}{MD}$
Breakwater (1) (Off shore side)	5.4	+6.5	25' TYPE	18.5 (2.0' × 1.5" × 3.0')			1.49 > 1.3
Breakwater (2) (Harbour side)	CHAPTER XII 12-2-2 (1) Reference						
Revetment (1)	3.3	+4.0				5.5	
Revetment (2) (Steel Sheet pipe pile)	CHAPTER XII 12-2-2 (4) Reference						
Groin and Training Dike	2.9	+4.0				4.0	

Note : Circular failure factors $F_s > 1.3$

Fig. 9-7-4(A-2) Mooring Facilities

Item	Design Depth (m)	Foundation Improvement Depth (m)	Maximum External Force (conditions)	Maximum stress		Bearing Capacity for Foundation $F = \frac{R}{P}$	Horizontal Deflection $\Delta = \frac{MR}{MD}$	Circular Failure $F = \frac{MR}{MD}$
				Vertical Pile $\sigma = \frac{QS}{\sigma_{ca}} + \frac{\sigma_{bc}}{\sigma_{be}}$	Batter Pile $\sigma = \frac{A}{p} (\text{Kg./cm}^2)$			
Berth								
Multi-Purpose	-12	-35	Earthquake	$\sigma = 0.95 < 1.0$		$F = 3.1 > 1.5$	$4.2 < 5.0$	$1.55 > 1.3$
Coal/Ore	-20	-35	"	$\sigma = 0.78 < 1.0$	$595 < 1.608$	$F = 2.4 > 1.5$	$2.9 < 5.0$	$1.33 > 1.3$
Container	-12	-35	Berthing	$\sigma = 0.84 < 1.0$		$F = 8.2 > 2.5$	$3.3 < 5.0$	$1.31 > 1.3$
General	-10	-35	"	$\sigma = 0.89 < 1.0$		$F = 7.7 > 2.5$	$2.9 < 5.0$	$1.38 > 1.3$
"	-12	-35	"					$1.31 > 1.3$
Grain	-12	-35	"	$\sigma = 0.77 < 1.0$		$F = 14 > 2.5$	$3.0 < 5.0$	$1.34 > 1.3$

Notes : Horizontal deflection (Allowable deflection 5'')

Circular failure

Safety factors $P_s > 1.3$

Fig. 9-7-4(A-3) Examination of Retaining Wall

Berth \ Item	Shapes of Retaining Wall	Examination of Safety Factor (During Earthquakes)		
		Sliding	Overturning	Subgrade Reaction
Multi-Purpose	L-Shaped Blocks	1.15 > 1.0	1.89 > 1.1	P=27.25t/m ² b=3.72m
Coal/Ore	Box Caisson	1.5 > 1.0	2.5 > 1.1	P=34.05t/m ² b=7.65m
Container	L-Shaped Blocks	1.14 > 1.0	1.66 > 1.1	P=32.04t/m ² b=3.12m
General Cargo (-12.0m)	"	1.14 > 1.0	1.66 > 1.1	P=32.04t/m ² b=3.12
" (-10.0m)	"	1.16 > 1.0	1.75 > 1.1	P=26.38t/m ² b=3.03m
Grain	"	1.16 > 1.0	1.75 > 1.1	P=26.38t/m ² b=3.03m

Note ; Subgrade Reaction P < 40t/m²

Fig. 9-7-4(A-4) Ancillary Facilities

Berth \ Item	Dimensions of Ships (DWT)	Fender (TYPE)	Berthing Energy (t·m)	Fender		Bollard (t/TYPE)
				Energy Absorption (t·m)	Reaction Force (t/Block)	
				H;mm		
Multi-Purpose	30,000	1,150 ^H	38.8	40.1	198	100
Coal/Ore	150,000	2,000 ^H	184	185	249	100
Container	32,000	1,300 ^H	45.3	45.4	178	100
General Cargo	15,000	1,000 ^H	21.4	22.9	126	70
Grain	30,000	1,300 ^H	40.4	42.8	170	100

Fig. 9-7-4(A-5) BREAKWATER

Circular failure ($X = -24.0$ $M_R = 25108.836$ $F = 1.497 > F_s = 1.3$
 $F_{min} = 0.0$ $R = 41.0$ $M_C = 166775.66$
 $1 \sim 3$ 0.86
 $6 \sim 8$ 0.86

SURCHARGE

	W ₁	W ₂	K	C ₀	φ
A	1.8	2.0	0.0	0.0	40.0
B	2.3	2.3	0.0	0.0	45.0
C	1.8	2.0	0.0	0.0	40.0
D	1.8	2.0	0.0	0.0	40.0
E	1.8	2.0	0.0	0.0	40.0
F	1.8	2.0	0.0	0.0	25.0
G	1.8	2.0	0.0	0.0	25.0
H	1.8	2.0	0.0	0.0	30.0
I	1.75	1.75	0.2	0.8	0.0

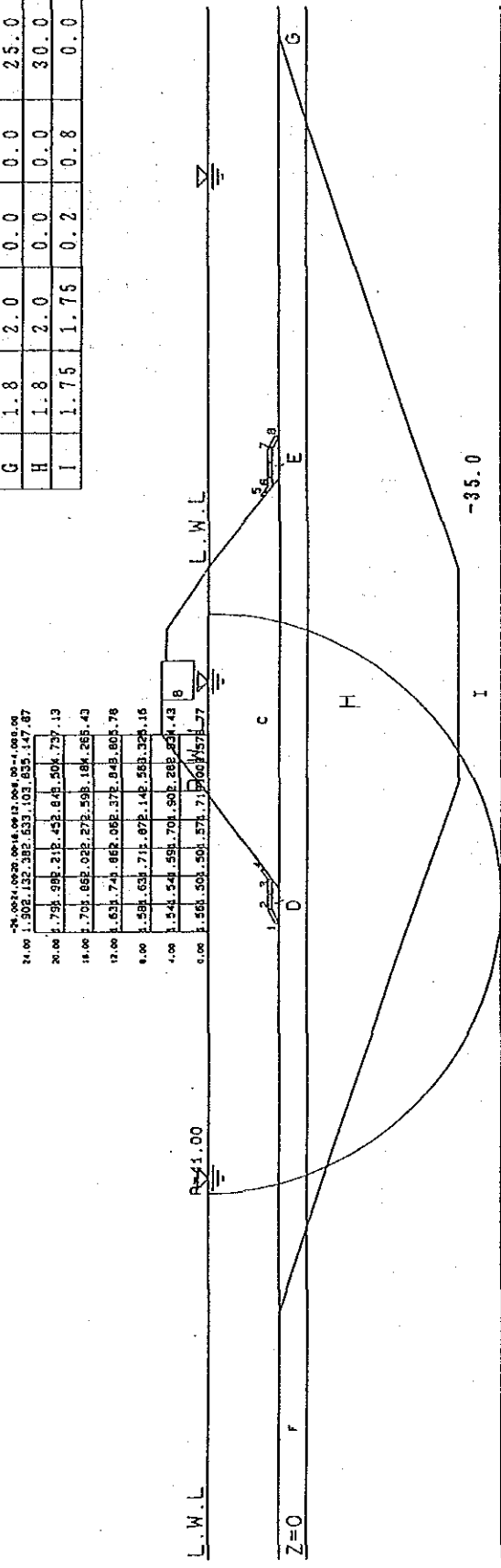


Fig. 9-7-4(A-6) Multi-purpose Berth (-12.0m)

Circular failure (F_{min} $X=8.0$ $Y=12.0$ $R=32.0$ $M_R=8945.480$ $F=1.552 > F_s=1.3$ $M_D=5762.148$)

SURCHARGE

1 ——— 2.00
2 ——— 2.00

	W1	W2	K	Co	ϕ
A	1.8	2.0	0.0	0.0	30.0
B	1.8	2.0	0.0	0.0	30.0
C	1.8	2.0	0.0	0.0	33.0
D	1.8	2.0	0.0	0.0	33.0
E	1.75	1.75	0.2	2.6	0.0
F	1.75	1.75	0.2	2.6	0.0

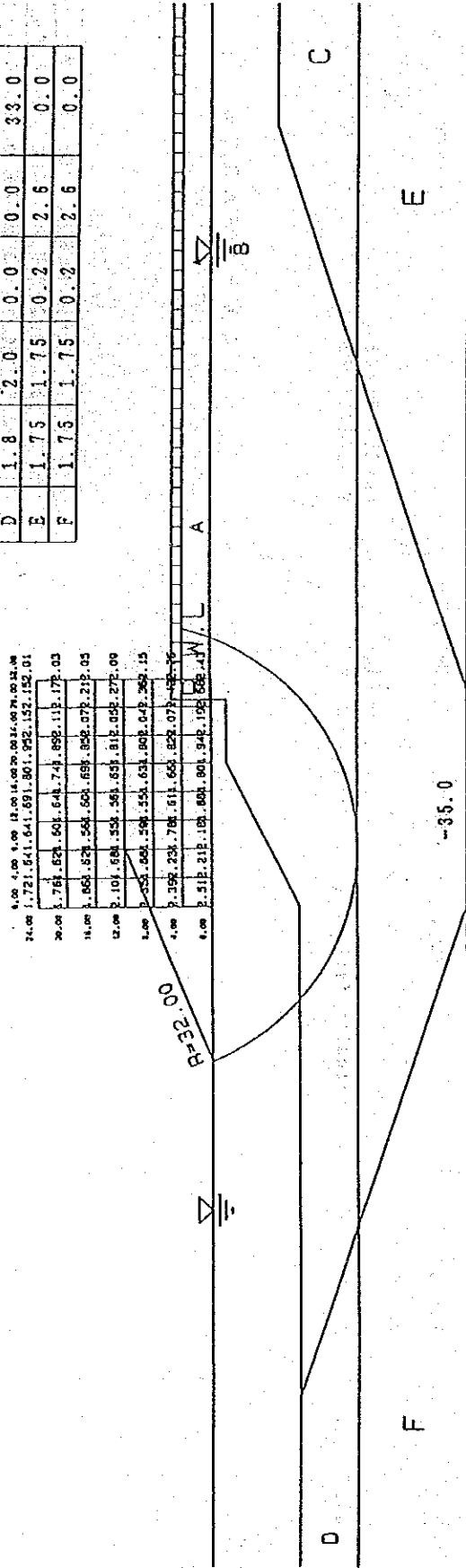


Fig. 9-7-4(A-7) COAL/ORE BERTH (-20.0m)

Circular failure (F_{min} $X=8.0$ $R=88.0$ $M_R=16378.164$ $F=1.326 > F_a=1.3$
 $Y=8.0$ $M_C=12355.160$)

SURCHARGE

- 1 — 2.00
- 2 — 2.00

	W ₁	W ₂	K	C _o	φ
A	1.8	2.0	0.0	0.0	30.0
B	1.8	2.0	0.0	0.0	30.0
C	1.8	2.0	0.0	0.0	33.0
D	1.75	1.75	0.2	3.0	0.0
E	1.75	1.75	0.2	3.0	0.0

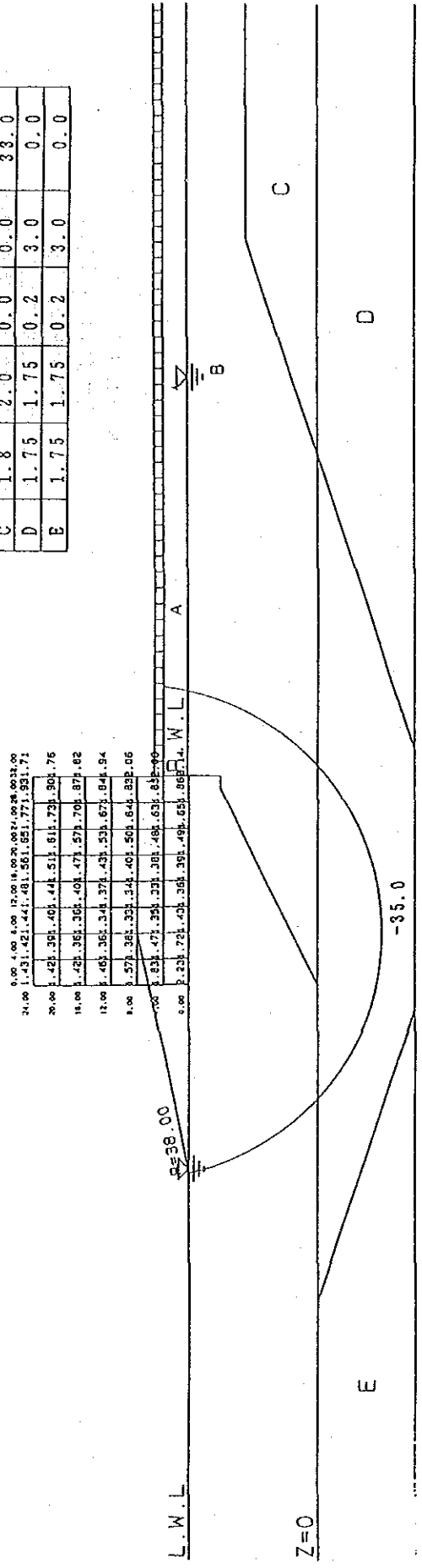


FIG. 9-7-4(A-8) CONTAINER BERTH (-12.0m)

Circular failure ($X=16.00$ $Y=20.00$ $M_R=60.0$ $M_R=39642.707$ $F=1.311 > F_a=1.3$ $M_D=30228.809$)

SURCHARGE

1 — 2.00
2 — 2.00

	W ₁	W ₂	K	C _o	φ
A	1.8	2.0	0.0	0.0	30.0
B	1.8	2.0	0.0	0.0	30.0
C	1.8	2.0	0.0	0.0	30.0
D	1.8	2.0	0.0	0.0	30.0
E	1.75	1.75	0.2	1.8	0.0

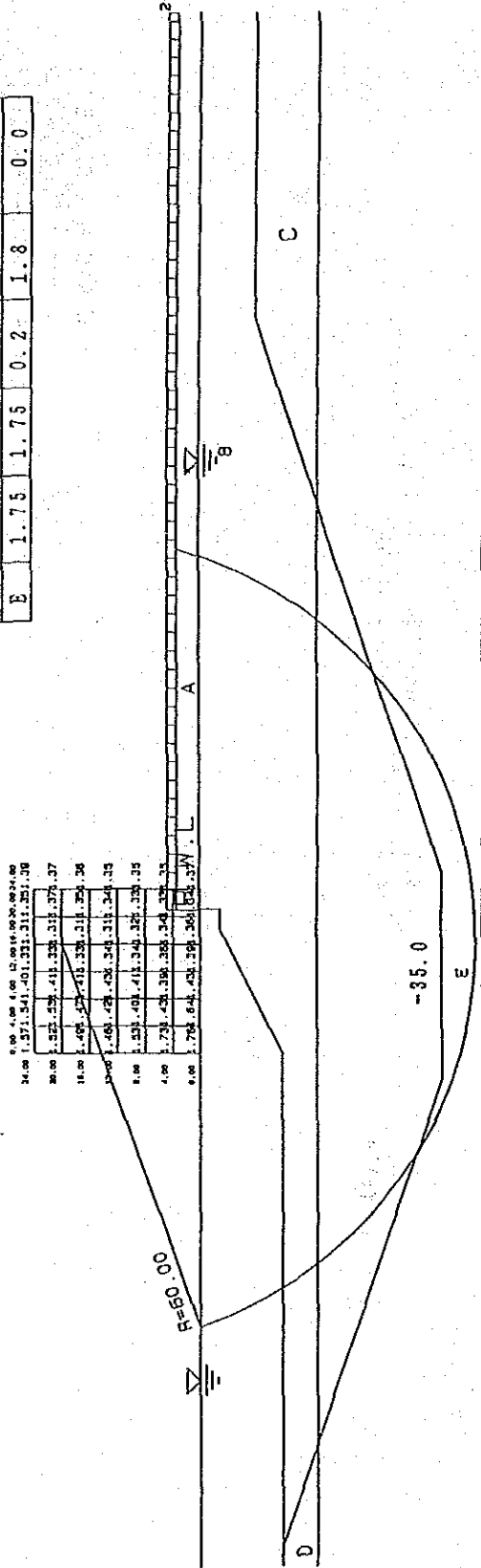


Fig. 9-7-4(A-10) GENERAL CARGO BERTH (-12.0m)

Circular failure F_{min} $X=16.00$ $R=56.0$ $M_R=35755.391$ $F=1.307 > F_a=1.3$
 $Y=16.00$ $M_0=27350.691$

SURCHARGE

- 1 — 2.00
- 2 — 2.00

	W ₁	W ₂	X	C ₀	φ
A	1.8	2.0	0.0	0.0	30.0
B	1.8	2.0	0.0	0.0	30.0
C	1.8	2.0	0.0	0.0	30.0
D	1.8	2.0	0.0	0.0	30.0
E	1.75	1.75	0.2	1.8	0.0

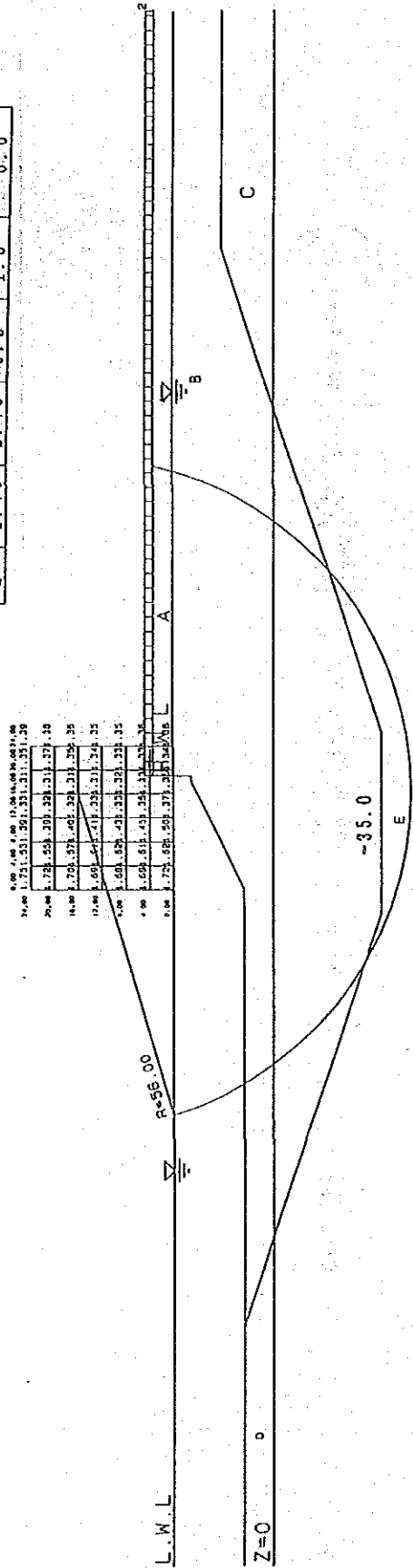


Fig. 9-7-4(A-11) GRAIN BERTH (-12.0m)

Circular failure (F_{min} $X=16.0$ $R=60.0$ $M_R=39949.672$ $F=1.336 > F_s=1.3$)
 $Y=20.0$ $M_D=29912.785$

SURCHARGE

- 1 — 2.00
- 2 — 2.00

	W1	W2	K	Cc	ϕ
A	1.8	2.0	0.0	0.0	30.0
B	1.8	2.0	0.0	0.0	30.0
C	1.8	2.0	0.0	0.0	30.0
D	1.75	1.75	0.2	1.8	0.0
E	1.8	2.0	0.0	0.0	30.0

0.00	1.531	1.571	1.611	1.651	1.691	1.731	1.771	1.811	1.851	1.891	1.931	1.971	2.011	2.051	2.091	2.131	2.171	2.211	2.251	2.291	2.331	2.371	2.411	2.451	2.491	2.531	2.571	2.611	2.651	2.691	2.731	2.771	2.811	2.851	2.891	2.931	2.971	3.011	3.051	3.091	3.131	3.171	3.211	3.251	3.291	3.331	3.371	3.411	3.451	3.491	3.531	3.571	3.611	3.651	3.691	3.731	3.771	3.811	3.851	3.891	3.931	3.971	4.011	4.051	4.091	4.131	4.171	4.211	4.251	4.291	4.331	4.371	4.411	4.451	4.491	4.531	4.571	4.611	4.651	4.691	4.731	4.771	4.811	4.851	4.891	4.931	4.971	5.011	5.051	5.091	5.131	5.171	5.211	5.251	5.291	5.331	5.371	5.411	5.451	5.491	5.531	5.571	5.611	5.651	5.691	5.731	5.771	5.811	5.851	5.891	5.931	5.971	6.011	6.051	6.091	6.131	6.171	6.211	6.251	6.291	6.331	6.371	6.411	6.451	6.491	6.531	6.571	6.611	6.651	6.691	6.731	6.771	6.811	6.851	6.891	6.931	6.971	7.011	7.051	7.091	7.131	7.171	7.211	7.251	7.291	7.331	7.371	7.411	7.451	7.491	7.531	7.571	7.611	7.651	7.691	7.731	7.771	7.811	7.851	7.891	7.931	7.971	8.011	8.051	8.091	8.131	8.171	8.211	8.251	8.291	8.331	8.371	8.411	8.451	8.491	8.531	8.571	8.611	8.651	8.691	8.731	8.771	8.811	8.851	8.891	8.931	8.971	9.011	9.051	9.091	9.131	9.171	9.211	9.251	9.291	9.331	9.371	9.411	9.451	9.491	9.531	9.571	9.611	9.651	9.691	9.731	9.771	9.811	9.851	9.891	9.931	9.971	10.011	10.051	10.091	10.131	10.171	10.211	10.251	10.291	10.331	10.371	10.411	10.451	10.491	10.531	10.571	10.611	10.651	10.691	10.731	10.771	10.811	10.851	10.891	10.931	10.971	11.011	11.051	11.091	11.131	11.171	11.211	11.251	11.291	11.331	11.371	11.411	11.451	11.491	11.531	11.571	11.611	11.651	11.691	11.731	11.771	11.811	11.851	11.891	11.931	11.971	12.011	12.051	12.091	12.131	12.171	12.211	12.251	12.291	12.331	12.371	12.411	12.451	12.491	12.531	12.571	12.611	12.651	12.691	12.731	12.771	12.811	12.851	12.891	12.931	12.971	13.011	13.051	13.091	13.131	13.171	13.211	13.251	13.291	13.331	13.371	13.411	13.451	13.491	13.531	13.571	13.611	13.651	13.691	13.731	13.771	13.811	13.851	13.891	13.931	13.971	14.011	14.051	14.091	14.131	14.171	14.211	14.251	14.291	14.331	14.371	14.411	14.451	14.491	14.531	14.571	14.611	14.651	14.691	14.731	14.771	14.811	14.851	14.891	14.931	14.971	15.011	15.051	15.091	15.131	15.171	15.211	15.251	15.291	15.331	15.371	15.411	15.451	15.491	15.531	15.571	15.611	15.651	15.691	15.731	15.771	15.811	15.851	15.891	15.931	15.971	16.011	16.051	16.091	16.131	16.171	16.211	16.251	16.291	16.331	16.371	16.411	16.451	16.491	16.531	16.571	16.611	16.651	16.691	16.731	16.771	16.811	16.851	16.891	16.931	16.971	17.011	17.051	17.091	17.131	17.171	17.211	17.251	17.291	17.331	17.371	17.411	17.451	17.491	17.531	17.571	17.611	17.651	17.691	17.731	17.771	17.811	17.851	17.891	17.931	17.971	18.011	18.051	18.091	18.131	18.171	18.211	18.251	18.291	18.331	18.371	18.411	18.451	18.491	18.531	18.571	18.611	18.651	18.691	18.731	18.771	18.811	18.851	18.891	18.931	18.971	19.011	19.051	19.091	19.131	19.171	19.211	19.251	19.291	19.331	19.371	19.411	19.451	19.491	19.531	19.571	19.611	19.651	19.691	19.731	19.771	19.811	19.851	19.891	19.931	19.971	20.011	20.051	20.091	20.131	20.171	20.211	20.251	20.291	20.331	20.371	20.411	20.451	20.491	20.531	20.571	20.611	20.651	20.691	20.731	20.771	20.811	20.851	20.891	20.931	20.971	21.011	21.051	21.091	21.131	21.171	21.211	21.251	21.291	21.331	21.371	21.411	21.451	21.491	21.531	21.571	21.611	21.651	21.691	21.731	21.771	21.811	21.851	21.891	21.931	21.971	22.011	22.051	22.091	22.131	22.171	22.211	22.251	22.291	22.331	22.371	22.411	22.451	22.491	22.531	22.571	22.611	22.651	22.691	22.731	22.771	22.811	22.851	22.891	22.931	22.971	23.011	23.051	23.091	23.131	23.171	23.211	23.251	23.291	23.331	23.371	23.411	23.451	23.491	23.531	23.571	23.611	23.651	23.691	23.731	23.771	23.811	23.851	23.891	23.931	23.971	24.011	24.051	24.091	24.131	24.171	24.211	24.251	24.291	24.331	24.371	24.411	24.451	24.491	24.531	24.571	24.611	24.651	24.691	24.731	24.771	24.811	24.851	24.891	24.931	24.971	25.011	25.051	25.091	25.131	25.171	25.211	25.251	25.291	25.331	25.371	25.411	25.451	25.491	25.531	25.571	25.611	25.651	25.691	25.731	25.771	25.811	25.851	25.891	25.931	25.971	26.011	26.051	26.091	26.131	26.171	26.211	26.251	26.291	26.331	26.371	26.411	26.451	26.491	26.531	26.571	26.611	26.651	26.691	26.731	26.771	26.811	26.851	26.891	26.931	26.971	27.011	27.051	27.091	27.131	27.171	27.211	27.251	27.291	27.331	27.371	27.411	27.451	27.491	27.531	27.571	27.611	27.651	27.691	27.731	27.771	27.811	27.851	27.891	27.931	27.971	28.011	28.051	28.091	28.131	28.171	28.211	28.251	28.291	28.331	28.371	28.411	28.451	28.491	28.531	28.571	28.611	28.651	28.691	28.731	28.771	28.811	28.851	28.891	28.931	28.971	29.011	29.051	29.091	29.131	29.171	29.211	29.251	29.291	29.331	29.371	29.411	29.451	29.491	29.531	29.571	29.611	29.651	29.691	29.731	29.771	29.811	29.851	29.891	29.931	29.971	30.011	30.051	30.091	30.131	30.171	30.211	30.251	30.291	30.331	30.371	30.411	30.451	30.491	30.531	30.571	30.611	30.651	30.691	30.731	30.771	30.811	30.851	30.891	30.931	30.971	31.011	31.051	31.091	31.131	31.171	31.211	31.251	31.291	31.331	31.371	31.411	31.451	31.491	31.531	31.571	31.611	31.651	31.691	31.731	31.771	31.811	31.851	31.891	31.931	31.971	32.011	32.051	32.091	32.131	32.171	32.211	32.251	32.291	32.331	32.371	32.411	32.451	32.491	32.531	32.571	32.611	32.651	32.691	32.731	32.771	32.811	32.851	32.891	32.931	32.971	33.011	33.051	33.091	33.131	33.171	33.211	33.251	33.291	33.331	33.371	33.411	33.451	33.491	33.531	33.571	33.611	33.651	33.691	33.731	33.771	33.811	33.851	33.891	33.931	33.971	34.011	34.051	34.091	34.131	34.171	34.211	34.251	34.291	34.331	34.371	34.411	34.451	34.491	34.531	34.571	34.611	34.651	34.691	34.731	34.771	34.811	34.851	34.891	34.931	34.971	35.011	35.051	35.091	35.131	35.171	35.211	35.251	35.291	35.331	35.371	35.411	35.451	35.491	35.531	35.571	35.611	35.651	35.691	35.731	35.771	35.811	35.851	35.891	35.931	35.971	36.011	36.051	36.091	36.131	36.171	36.211	36.251	36.291	36.331	36.371	36.411	36.451	36.491	36.531	36.571	36.611	36.651	36.691	36.731	36.771	36.811	36.851	36.891	36.931	36.971	37.011	37.051	37.091	37.131	37.171	37.211	37.251	37.291	37.331	37.371	37.411	37.451	37.491	37.531	37.571	37.611	37.651	37.691	37.731	37.771	37.811	37.851	37.891	37.931	37.971	38.011	38.051	38.091	38.131	38.171	38.211	38.251	38.291	38.331	38.371	38.411	38.451	38.491	38.531	38.571	38.611	38.651	38.691	38.731	38.771	38.811	38.851	38.891	38.931	38.971	39.011	39.051	39.091	39.131	39.171	39.211	39.251	39.291	39.331	39.371	39.411	39.451	39.491	39.531	39.571	39.611	39.651	39.691	39.731	39.771	39.811	39.851	39.891	39.931	39.971	40.011	40.051	40.091	40.131	40.171	40.211	40.251	40.291	40.331	40.371	40.411	40.451	40.491	40.531	40.571	40.611	40.651	40.691	40.731	40.771	40.811	40.851	40.891	4
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Fig. 9-7-4(A-a) PLAN (A)

SHORT TERM DEVELOPMENT PLAN (2000) MASTER PLAN (2,010)

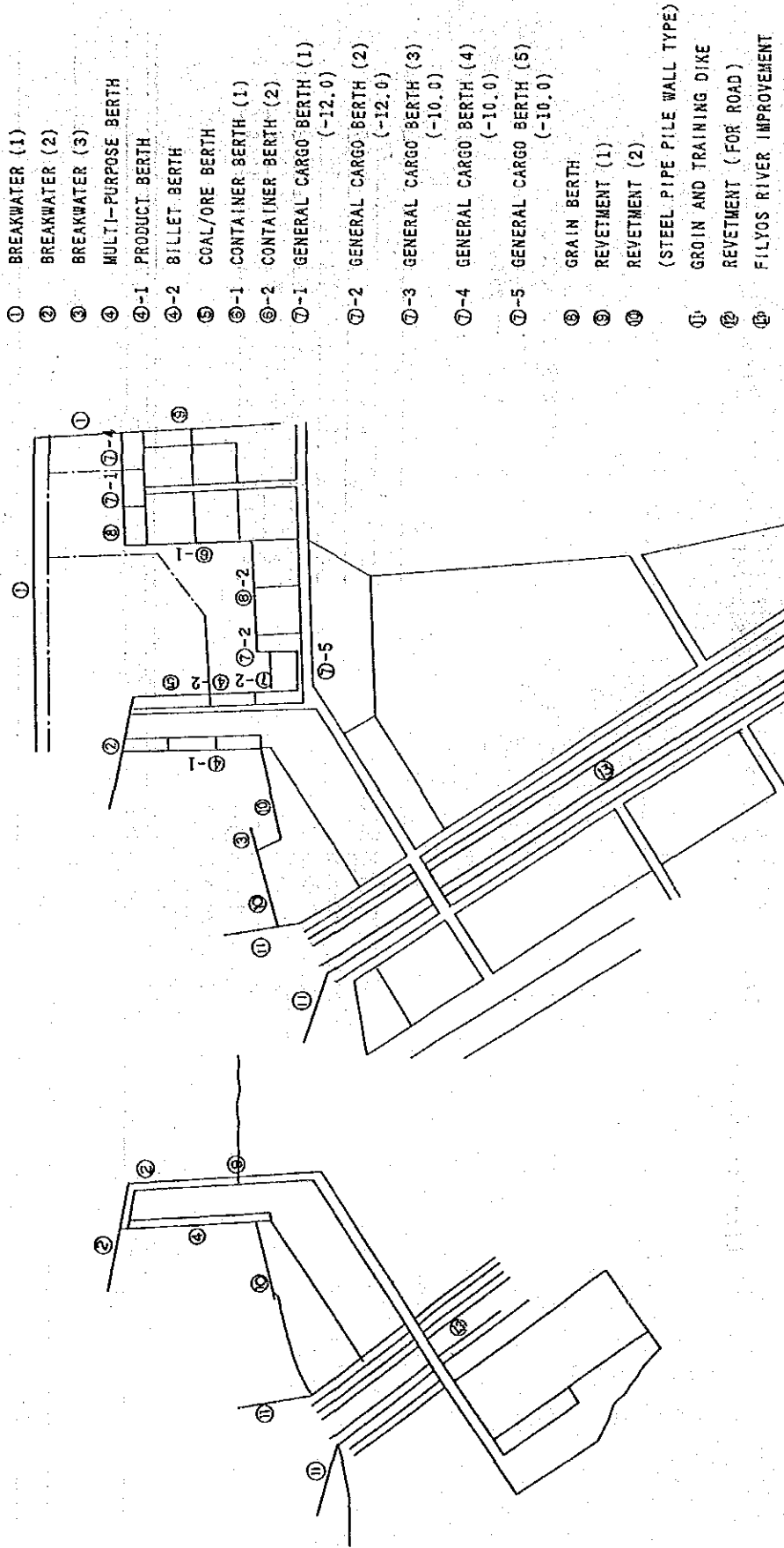
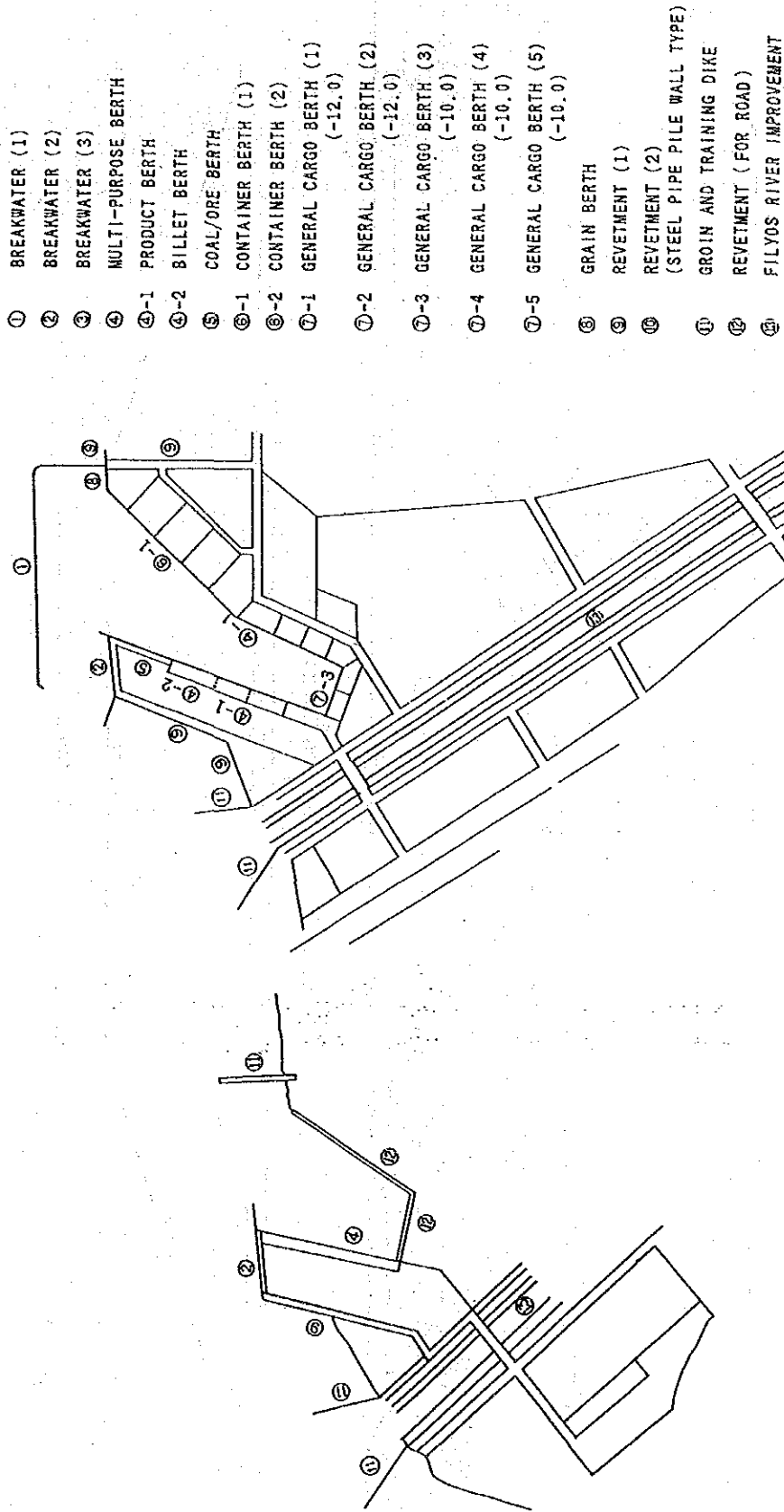


Fig. 9-7-4(A-b) PLAN (B)

SHORT TERM DEVELOPMENT PLAN (2000) MASTER PLAN (2010)



- ① BREAKWATER (1)
- ② BREAKWATER (2)
- ③ BREAKWATER (3)
- ④ MULTI-PURPOSE BERTH
- ④-1 PRODUCT BERTH
- ④-2 BILLET BERTH
- ⑤ COAL/ORE BERTH
- ⑥-1 CONTAINER BERTH (1)
- ⑥-2 CONTAINER BERTH (2)
- ⑦-1 GENERAL CARGO BERTH (1) (-12.0)
- ⑦-2 GENERAL CARGO BERTH (2) (-12.0)
- ⑦-3 GENERAL CARGO BERTH (3) (-10.0)
- ⑦-4 GENERAL CARGO BERTH (4) (-10.0)
- ⑦-5 GENERAL CARGO BERTH (5) (-10.0)
- ⑧ GRAIN BERTH
- ⑨ REVETMENT (1)
- ⑩ REVETMENT (2) (STEEL PIPE PILE WALL TYPE)
- ⑪ GROIN AND TRAINING DIKE
- ⑫ REVETMENT (FOR ROAD)
- ⑬ FLYDYS RIVER IMPROVEMENT

Fig. 9-7-4(A-C) ① BREAKWATER (1)
 SLOPING TYPE WITH DISSIPATING CONCRETE BLOCKS (PLAN A AND B) (Unit; m)

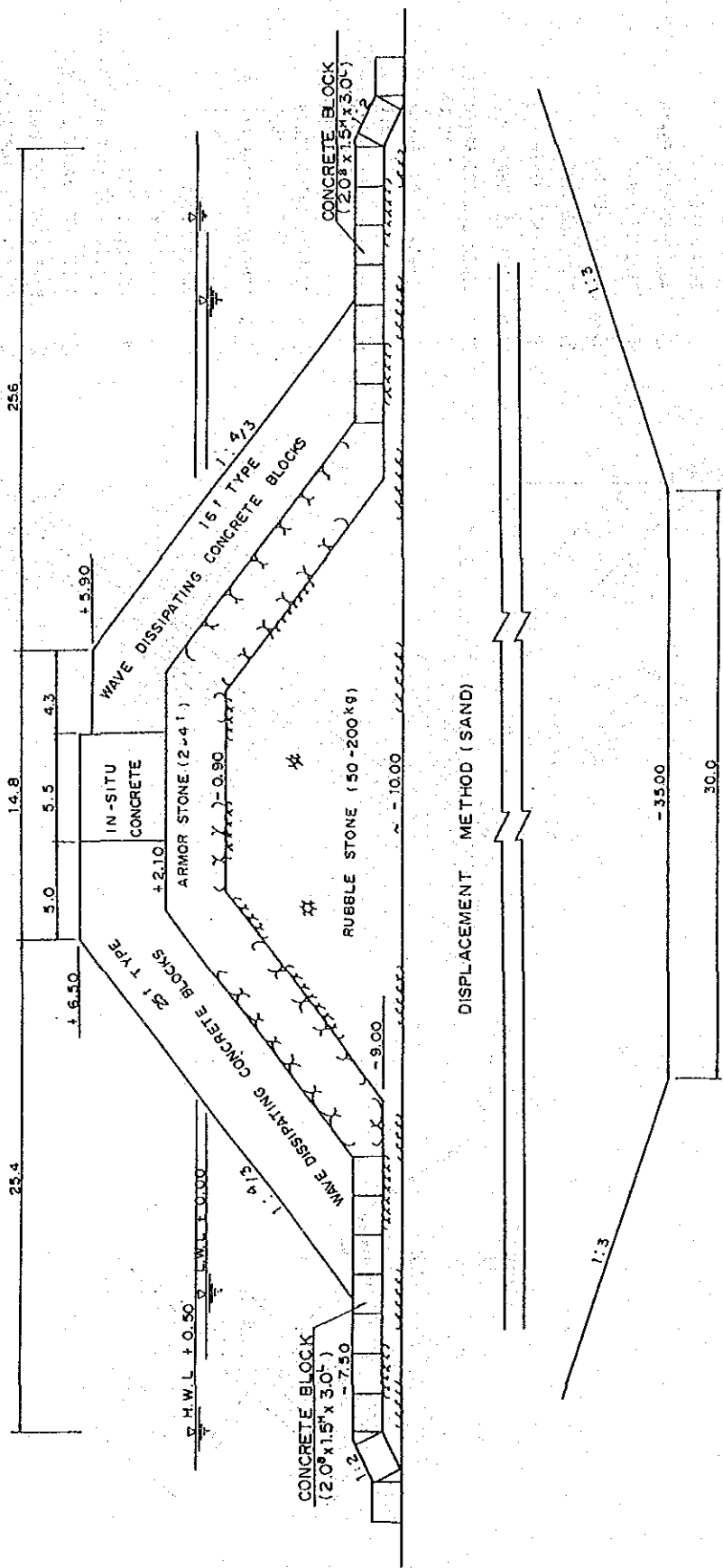


Fig. 9-7-4(A-d) ② BREAKWATER (2) (PLAN A AND B) (Unit: m)

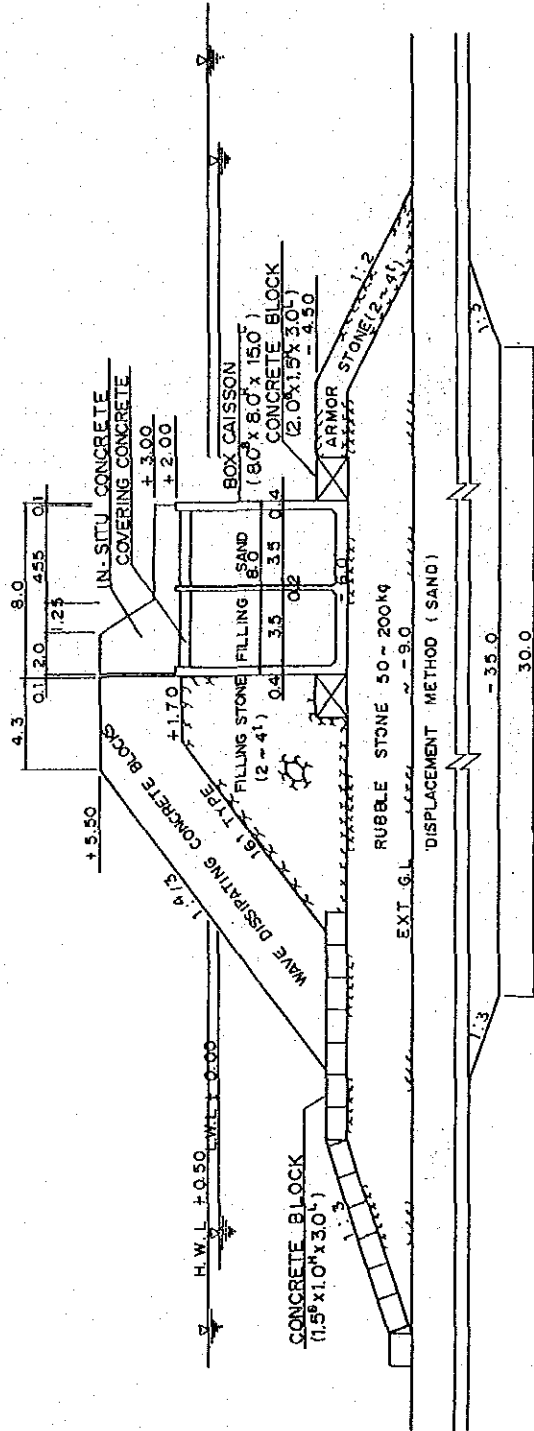


Fig. 9-7-4(A-e) ③ BREAKWATER (3) (PLAN A) (Unit: m)

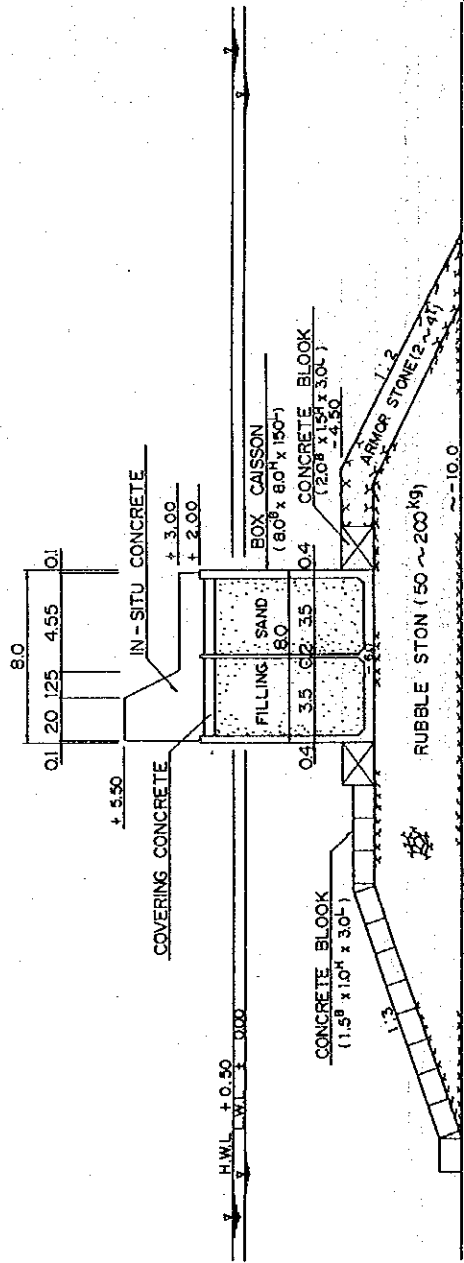


Fig. 9-7-4(A-g) ⑤ COAL/ORE BERTH (PLAN A AND B) (Unit: m)

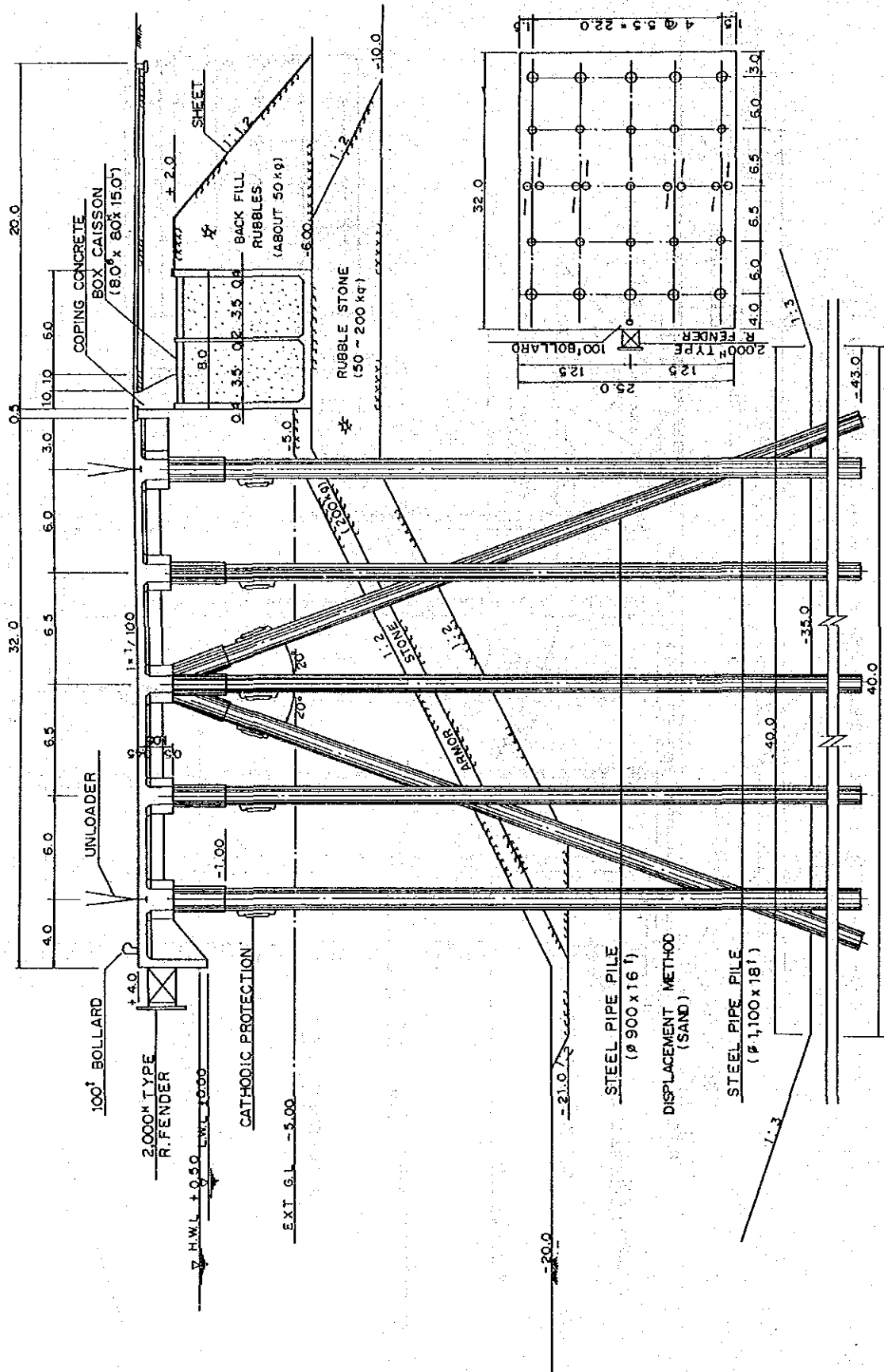


Fig. 9-7-4(A-h) ⑥ -1 CONTAINER BERTH (-12.0) (PLAN A AND B) (Unit; m)

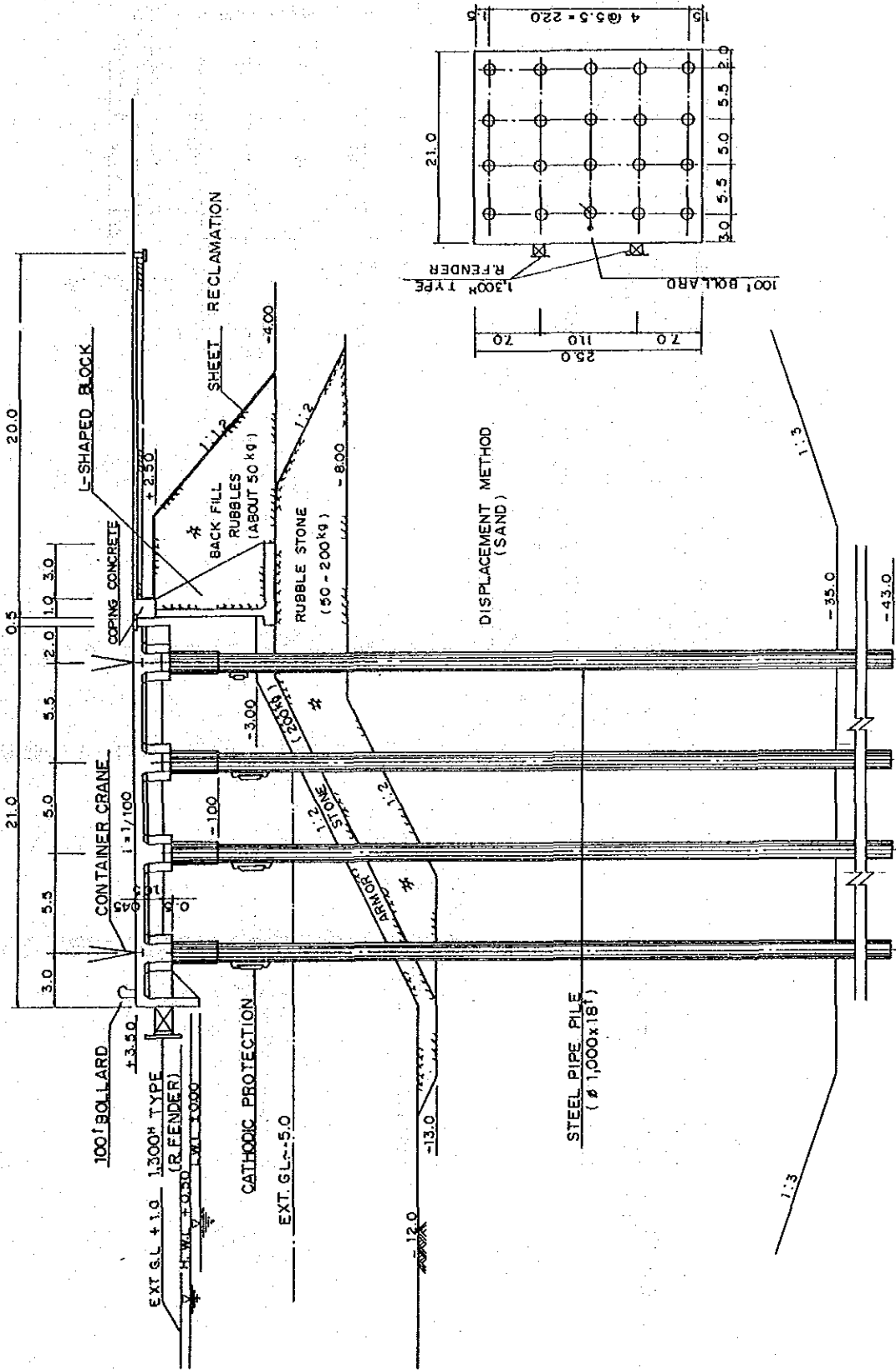


Fig. 9-7-4(A-i) ②-2 CONTAINER BERTH (-12.0) (PLAN A) (Unit; m)

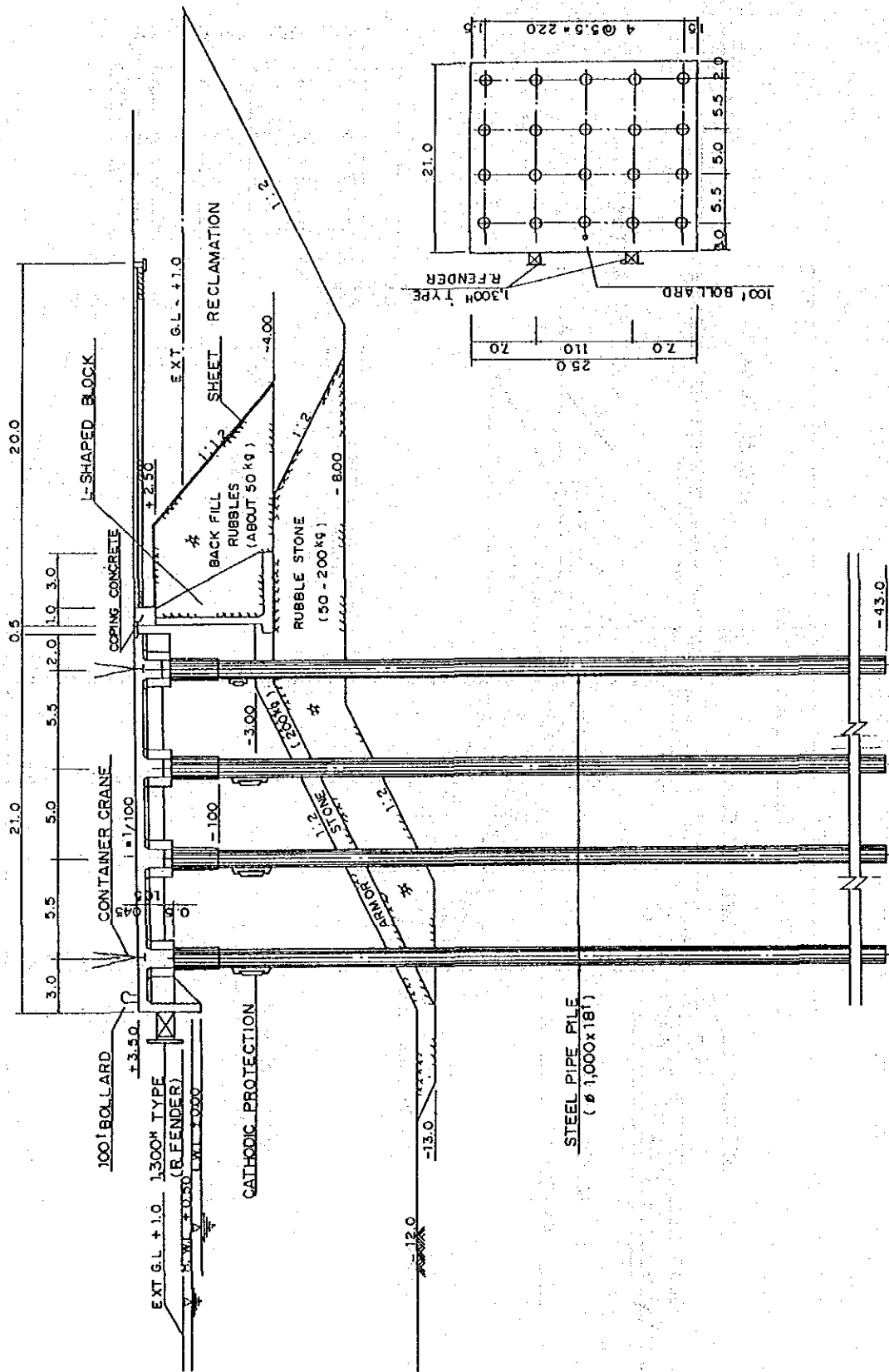


Fig. 9-7-4(A-j) ⑦ -1 GENERAL CARGO BERTH (-12.0) (PLAN A) (Unit; m)

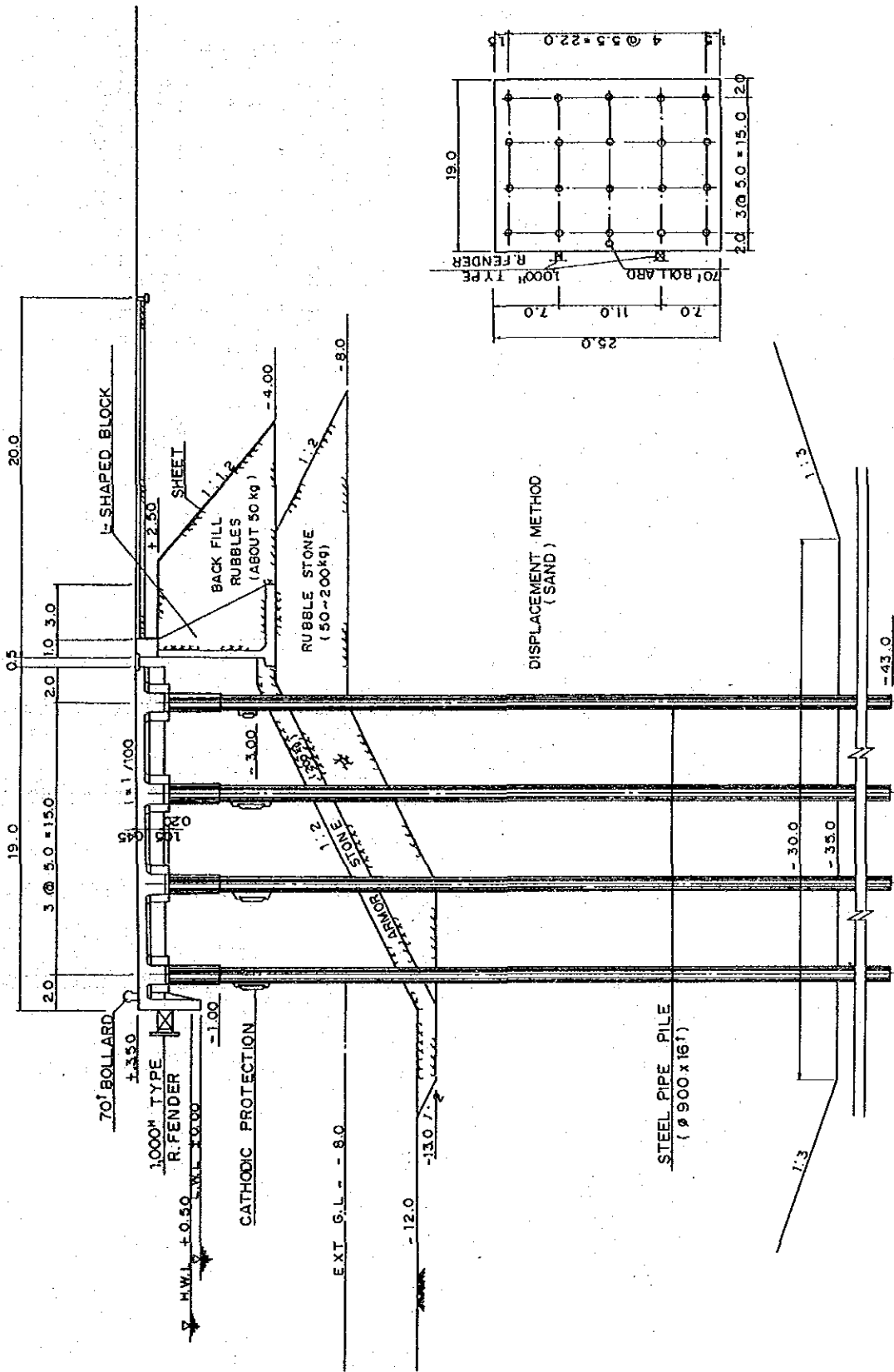


Fig. 9-7-4(A-k) ⑦ -2 GENERAL CARGO BERTH (-12.0) (PLAN A) (Unit; m)

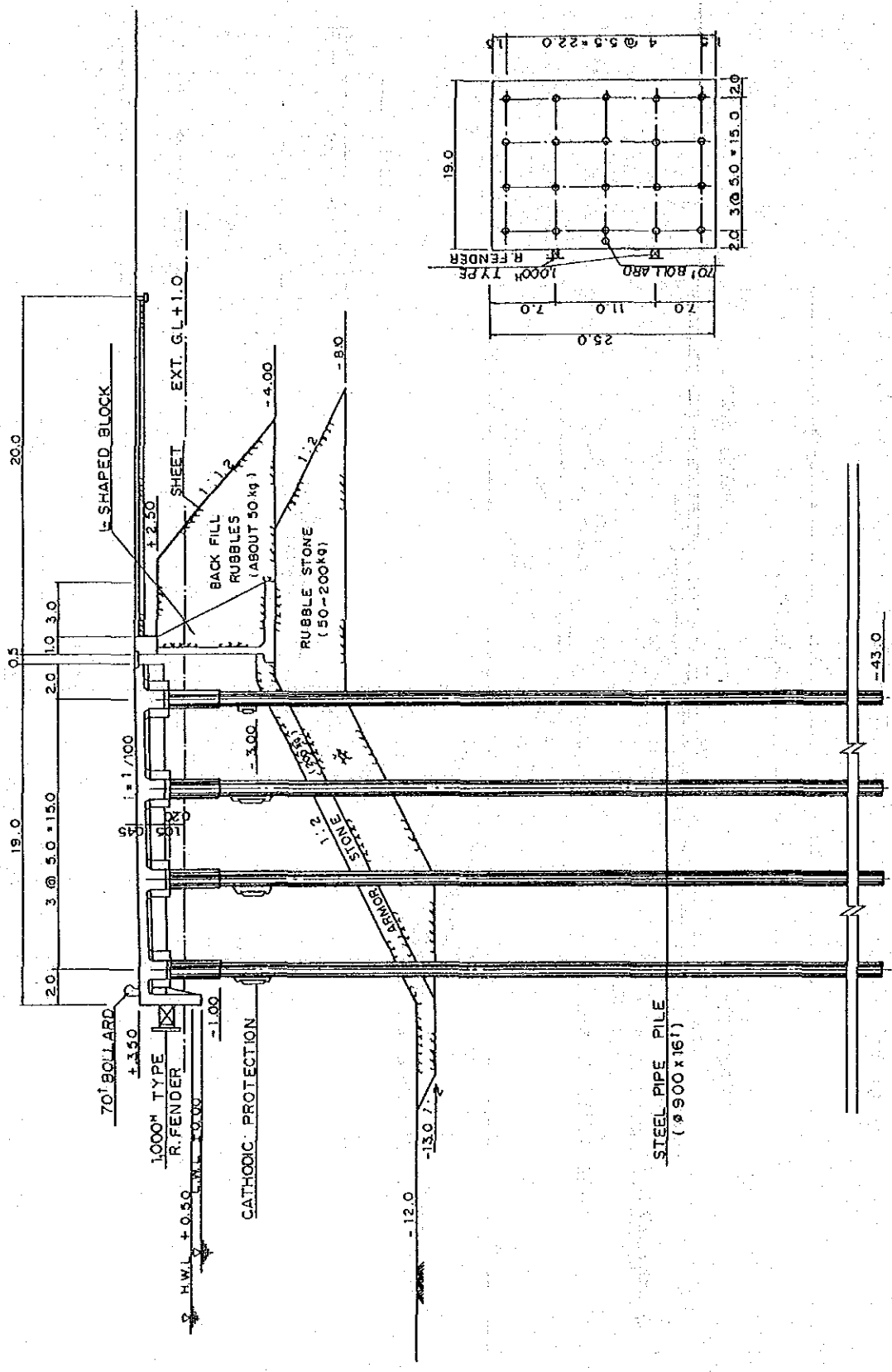


Fig. 9-7-4(A-m) ⑦ -4 GENERAL CARGO BERTH (PLAN A) (Unit; m)

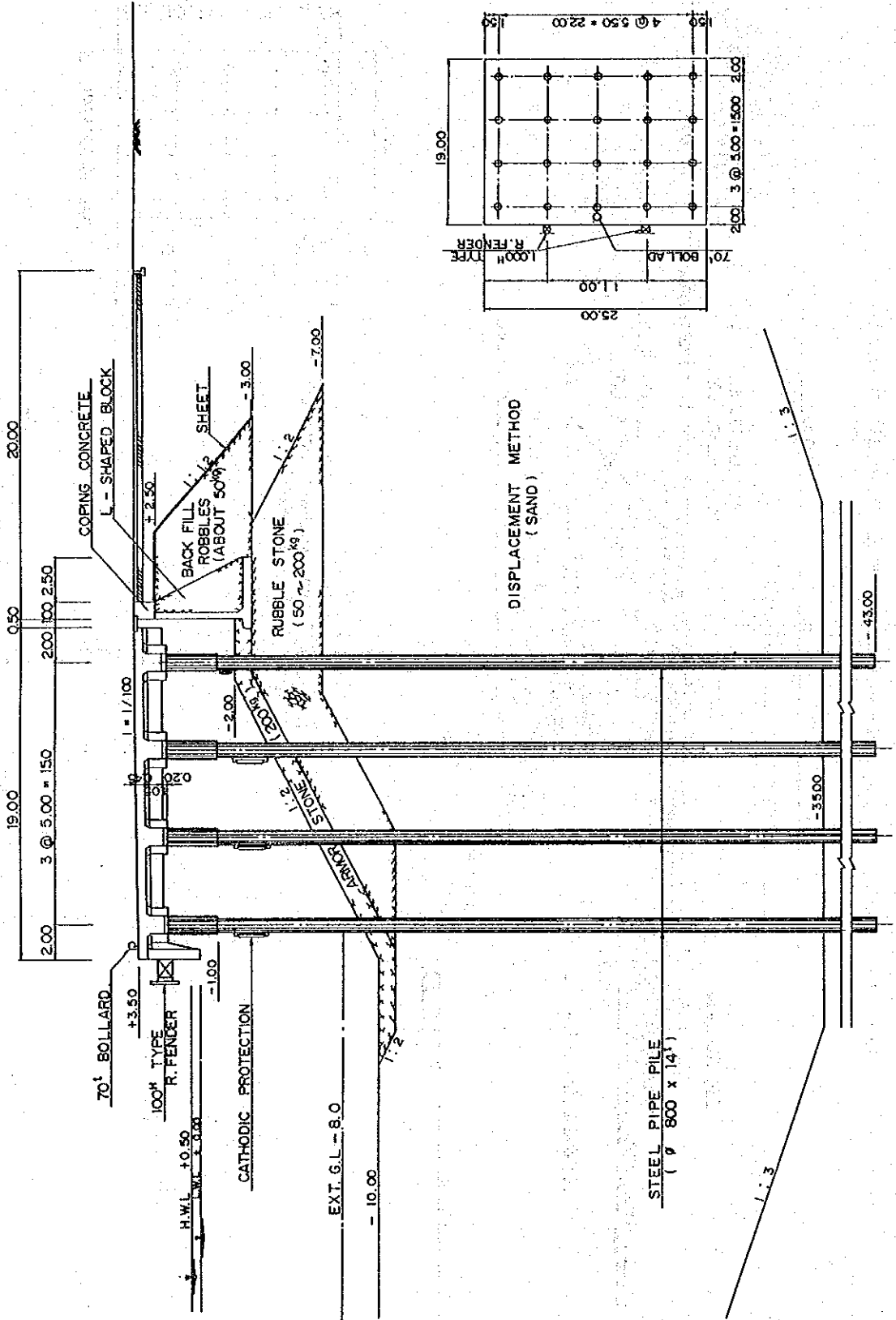


Fig. 9-7-4(A-n) ⑦ -5 GENERAL CARGO BERTH (PLAN A) (Unit; m)

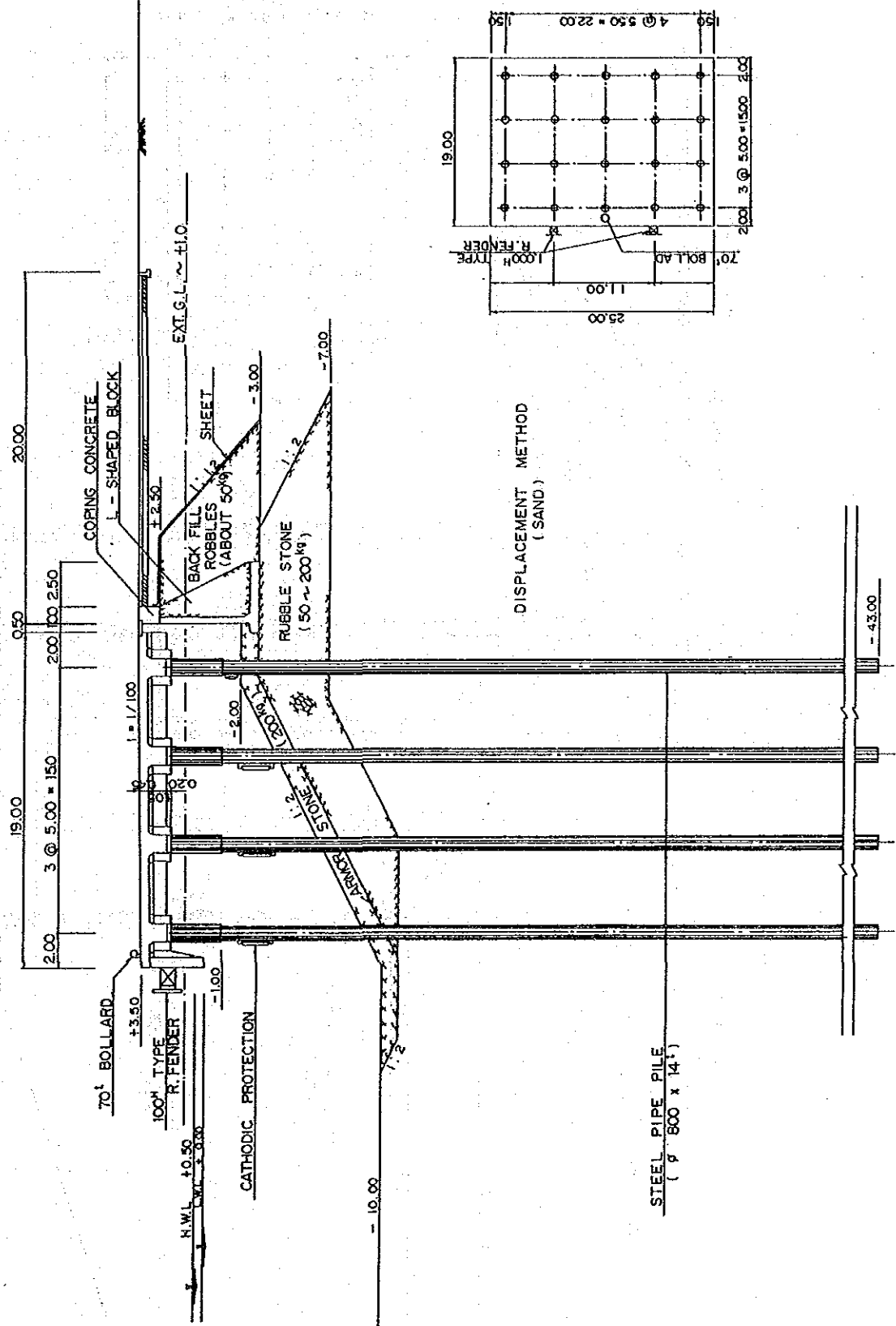


Fig. 9-7-4(A-r) (1) REVETMENT (2)
 (STEEL PIPE PILE WALL TYPE) (PLAN A) (Unit; m)

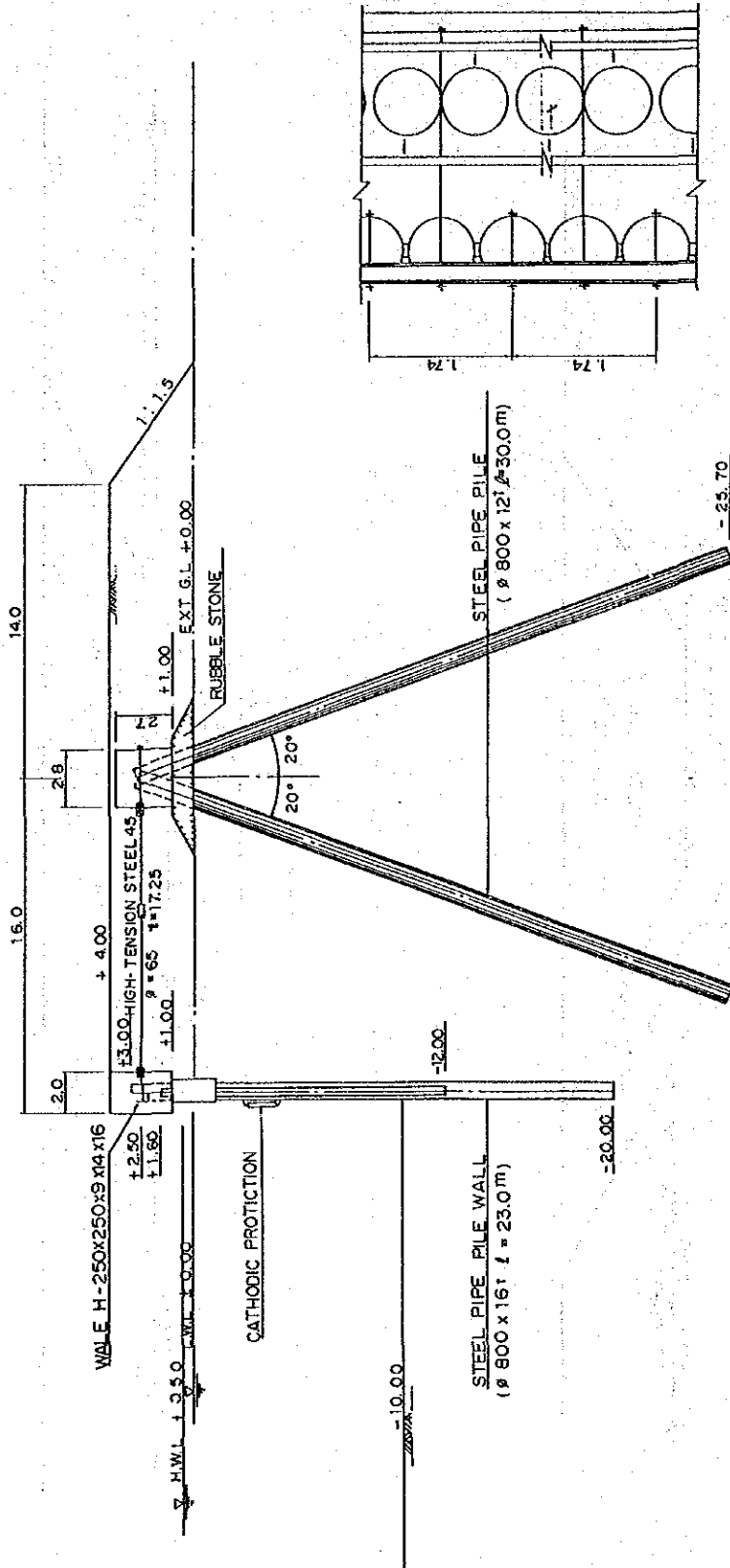


Fig. 9-7-4(A-s) ㉔ REVETMENT (FOR ROAD) (PLAN B) (Unit; m)

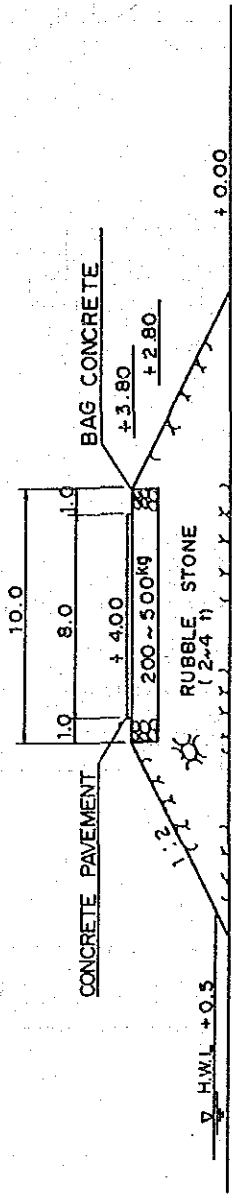


Fig. 9-7-4(A-t) ㉕ FIFYOS RIVER IMPROVEMENT PLAN (PLAN A AND B) (Unit; m)

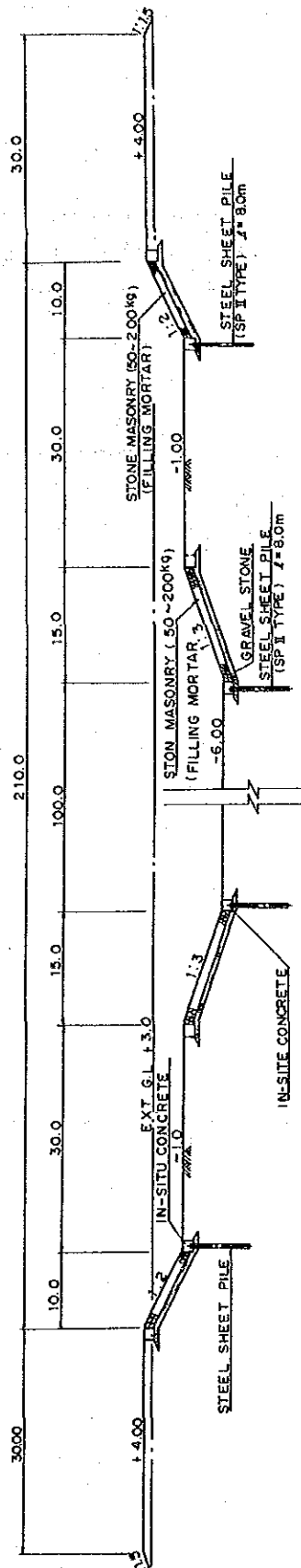
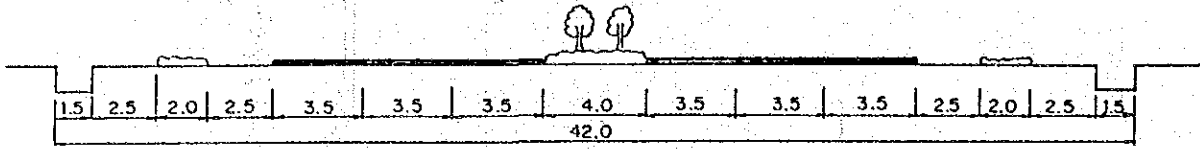


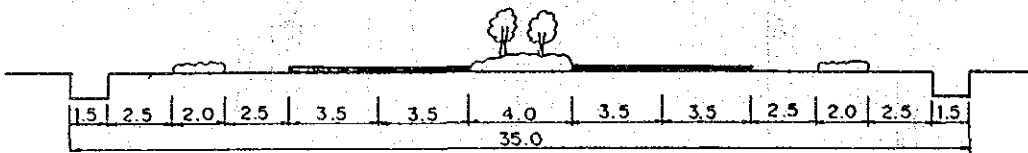
Fig. 9-7-4(A-u) Road and Bridge Sections (Unit; m)

Road Sections

(6 - Lanes)



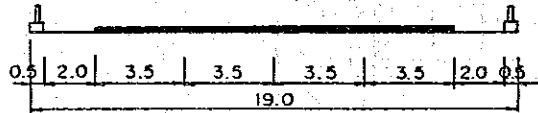
(4 - Lanes)



Bridge Sections

Short Term Development Plan (2,000)

(4 - Lanes)



Master Plan, (2,010)

(6 - Lanes)

